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COVER: A view of the New York sky line at the Southern tip of Manhattan Island. In the foreground may be seen the Battery and in the distance the tall buildings of the Wall Street financial section.

Traffic Engineering is that phase of engineering which deals with the planning and geometric design of streets, highways, and abutting lands, and with traffic operation thereon, as their use is related to the safe, convenient, and economic transportation of persons and goods.

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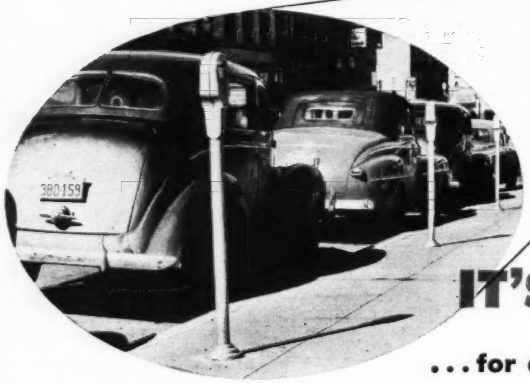
IN PORTLAND THEY SAY—



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21st Annual Meeting - New York, N. Y. Institute of Traffic Engineers

Hotel Commodore — September 24-27, 1950

REGISTRATION:
COMMODORE HOTEL—BEGINNING
SUNDAY AFTERNOON, SEPTEMBER 24

SUNDAY, SEPTEMBER 24, 1950

MORNING—BOARD OF DIRECTION MEETING
AFTERNOON—TECHNICAL COMMITTEE MEETINGS AND ANNUAL BUSINESS MEETING
EVENING—PAST PRESIDENTS' DINNER

MONDAY, SEPTEMBER 25, 1950

MORNING—BISCUIT BANTER BREAKFAST
The Resolutions Committee
WELCOME TO DELEGATES
Hon. William O'Dwyer, Mayor, City of New York
UNION BUS TERMINAL FOR INTERCITY BUSES
Speaker To Be Announced
UNION TRUCK TERMINAL OPERATIONS
Speaker To Be Announced
PARKING GARAGES THAT REALLY SERVE
Fred W. Moe, President, Ramp Buildings Corporation, New York, N. Y.
LUNCHEON—GUESTS OF AUTOMOBILE CLUB OF NEW YORK
AFTERNOON—FIELD TRIP TO:
BROOKLYN-BATTERY TUNNEL
BATTERY PARKING GARAGE
NEW YORK UNION MOTOR TRUCK TERMINAL
PORT AUTHORITY BUS TERMINAL

TUESDAY, SEPTEMBER 26, 1950

MORNING—EXPRESSWAYS AND THE CITY PLAN
Peter P. Hale, Mowbray, Jones & Hale Associates, New Haven, Connecticut
EFFECTIVE USE OF O-D DATA
Winston H. Carsten, Asst. Planning Engineer, Washington Dept. of Highways
ESTIMATING INDUCED TRAFFIC
Speaker To Be Announced
PAY AS YOU GO vs. BOND ISSUES
Roy Jorgenson, Deputy Commissioner and Chief Engineer, Connecticut Highway Dept.
GROUP LUNCHEONS
AFTERNOON—THE ROLE OF HIGHWAY TRANSPORT IN CIVIL DEFENSE
Speaker To Be Announced
WHAT'S AHEAD IN TRAFFIC VOLUMES?
Speaker To Be Announced
WHAT ABOUT THE PEDESTRIAN?
Burton W. Marsh, Director Traffic Engineering and Safety Dept., AAA
WHAT ABOUT SPEED LIMITS? (PANEL)
Participants:
J. E. P. Darrell, Traffic Engineer, Minnesota Dept. of Highways
J. E. Johnston, Traffic Engineer, Nebraska Dept. of Roads and Irrigation
T. E. Transeau, Director, Pennsylvania Bureau of Highway Safety
C. C. Wiley, Professor of Highway Engineering, University of Illinois
EVENING—ANNUAL BANQUET
Music is being provided by the Entertainment Committee

WEDNESDAY, SEPTEMBER 27, 1950

MORNING—EFFECTIVE PROTECTION FOR SCHOOL CROSSINGS
George W. Howie, Traffic Engineer, City of Cincinnati
MANHATTAN TRAFFIC SIGNAL PLAN
Charles Michalski, Engineer of Traffic Design, Dept. of Traffic, New York City
TRAFFIC PROVIDES ITS OWN PROGRESSION
Speaker To Be Announced
IT TAKES MORE THAN TRAFFIC ENGINEERING
Lloyd B. Reid, Commissioner, Dept. of Traffic, New York City
NOON AND AFTERNOON—BOAT TRIP AROUND NEW YORK HARBOR WITH LUNCH ABOARD —FOR MEMBERS, WIVES, AND GUESTS. GUESTS OF THE PORT OF NEW YORK AUTHORITY.

THURSDAY, SEPTEMBER 28, 1950

POST CONVENTION TOURS

Tours of major highway and traffic projects in the vicinity of New York City are tentatively scheduled for September 28. An expression of membership interest will be solicited.

TO ENTERTAIN THE LADIES

An interesting group of events is planned especially for the ladies including tours to the United Nations and the Editorial Workshop of the "Ladies Home Journal." Tickets for radio and television programs will be available and there will be ample opportunity to shop.

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Traffic and Highway Planning for the New York-New Jersey Metropolitan Area

Traffic Engineering Problems in New York City

By David R. Post
Director of Traffic Safety, New York City Department of Traffic

Through the courtesy of the editor of "Traffic Engineering," the New York Metropolitan Section of the Institute of Traffic Engineers has arranged for a series of articles commenting on the development of various highway and traffic agencies in the New York-New Jersey metropolitan area and describing some of their significant projects. These articles, appearing in the June, July and August issues of the magazine, point out the coordination which has been necessary in order to provide a comprehensive highway system in this area. It is hoped that publication of these articles will also stimulate interest on the part of those attending the Twenty-first Annual Meeting of the ITE, to be held in New York from September 24 to 27, 1950, so that the delegates will take the opportunity to visit and inspect some of these projects which may provide ideas helpful in meeting their own local problems.

NEW YORK CITY, foremost among the large cities of the world, challenges the imagination of those who have never visited the metropolis and whose knowledge of the city is derived from sources other than direct contact. New York is visualized as a city of towering buildings and such famous landmarks as Times Square, Radio City, the Empire State Building, etc. Most people who have never been to New York thus think about the city in terms of Manhattan only.

Actually, New York City affords a full range of community life that may be found anywhere else in the country, beginning with the heavily congested business and amusement areas of midtown and lower Manhattan and extending to the virtually rural sections of outlying precincts in Queens, the Bronx and Staten Island. The population of New York City today is close to 8,000,000 according to the preliminary 1950 census figures. The Borough of Manhattan accounts for 1,940,000 of them on its 22.30 square miles of island. Brooklyn is the home of 2,720,000 people and is one of the world's largest cities in its own right. Its area is 80.95 square miles. The Bronx covers 41.41 square miles and is the home borough of 1,445,000 people. The Borough of Queens on Long Island covers 118.60 square miles. Its activities and population are rapidly expanding, with the latter now set at 1,545,000 people. The Borough of Richmond, which is Staten Island, has a population of 190,000 people and an area of 57 square miles.

When the stranger thinks of Manhattan, he visualizes tall structures and great moving masses of humanity on its surface, but he can attain no true appreciation of Manhattan until he really gets "under" it. There, beneath the surface and extending into the surrounding boroughs of the city, is an amazing network of rapid transit facilities providing a service to millions, without which Manhattan never could have attained the importance it has, nor New York City its greatness.

The magnitude of the task of moving great multitudes of people and vehicles is demonstrated by the fact that more than 3,765,000 persons and 382,000 automobiles, buses, and trucks enter midtown and lower Manhattan every business day. Of this number, nearly 2½ million persons enter the area by rapid transit facilities. This has had a great impact upon the traffic problems confronting the city, for while the area of the city has not been extended since its incorporation 52 years ago, its tremendous increase in population, business, and industry in the half-century, together with the extraordinary increase in vehicles and people entering the city, has taxed all the city's transportation facilities to the utmost.

Creating A City Traffic Commission

The problems of moving people and the great volumes of business and industry located in New York City, with its extremely heavy movement of freight by truck, has created a need for corrective action which has taxed the ingenuity of the City's officials and agencies which have been responsible for these matters. Truck traffic, although the cause of many of the city's traffic problems, is essential and contributes greatly to its prosperity and well-being. The problem is to find ways and means to accommodate more traffic and to move it more expeditiously.

It was primarily for this reason that on February 1, 1949 a Traffic Commission and a Department of Traffic Engineering, as the Commission's operating staff, were created at the behest of Mayor William O'Dwyer. This marked the establishment of the first full-time agency charged with the duty of tackling the City's growing traffic problem.

The Commission was composed, in addition to the Executive Director of the Department of Traffic Engineering, of heads of six other City departments whose activities and functions definitely were related to vehicular traffic. However, since these six members were heads of other City departments, their responsibilities were of such magnitude that they could devote only a portion of their time and effort to the importance of traffic conditions.

It became obvious to the Mayor, as well as to the members of the Traffic Commission themselves, that a revision of the set-up was essential if any accomplishments were to be obtained without undue delay. Mayor O'Dwyer, therefore, initiated a local law amending the City Charter, which abolished both the Traffic Commission and the Department of Traffic Engineering and replaced them with a Department of Traffic headed by a single Commissioner, with power to appoint two deputies, one of whom must be a licensed professional engineer with at least five years practical experience in traffic engineering.

This new law became effective with the Mayor's signature on June 7, 1950, at which time the Mayor appointed and formally inducted Lloyd B. Reid (Mem., ITE) as Commissioner of the Department of Traffic.. In this capacity Commissioner Reid, within the provisions of the law, assumed the duties, responsibilities and authority hitherto vested in the Traffic Commission. Mr. Reid had been Consultant to both the Traffic Commission and the Department of Traffic Engineering during their comparatively brief existence. T. T. Wiley (Mem., ITE), former Executive Director of the Department of Traffic Engineering was appointed as first deputy commissioner.

As a new city-wide department it is essential that the Department of Traffic consider the growing traffic problem from an overall City viewpoint. While the five boroughs may be regarded as separate entities in some respects, the life of the City as a whole is closely integrated and traffic problems and conditions in one borough have definite bearing and relationship to traffic conditions in the other boroughs.

The Commissioner of Traffic has the powers and responsibilities necessary to make all traffic rules and regulations, establish the design and location of traffic control devices, direct the installation and maintenance of traffic control devices, carry on a traffic safety education program, establish parking meter zones and make reports of need for off-street parking facilities, street lighting, new traffic facilities and other traffic matters.

Improving Traffic Conditions

During its brief existence, the Traffic Commission had made important progress towards improving traffic conditions affecting both motorists and pedestrians. Three major steps in this direction are outstanding. The first was a recommendation by the Traffic Commission to the Mayor for the creation of a City Parking Authority to provide for the construction and financing of off-street parking facilities. Legislation providing for the establishment of a Parking Authority was enacted at the recent session of the State Legislature and this new agency will come into being with the selection of its members by the Mayor.

A second step was the recommendation that the necessary local law amending the City Charter be adopted to enable the installation and operation of parking meters. This has been done and initial installations totaling approximately 1500 meters should be completed this year.

Columbus Circle, located at the intersection of Broadway, West 59th Street, Eighth Avenue and Central Park West, has been re-designed to permit a free flow of traffic through this heavily congested intersection.

The third major step was the development by the Department of Traffic Engineering of a revised signal operation plan for the Borough of Manhattan, which was approved in principle by the Traffic Commission. The first section of the new signal system for Manhattan was installed by Commissioner Reid on Ninth and Tenth Avenues on July 10. This plan is the first major step in a city-wide program for improved traffic control.

Most of Manhattan is laid out in a grid pattern, with the avenues running north and south, spaced from 600 to 900 feet apart, and the streets running east and west, spaced only 260 feet apart. Broadway cuts across this gridiron, creating difficult traffic situations at Union Square, Times Square, Columbus Circle, and other points. Most of the intersections in Manhattan are signalized and are timed along the avenues as simultaneous systems on a 90-second cycle. The new signal operation plan is designed to reduce congestion and accidents and to shorten the running time on north-south avenues, as well as on major crosstown streets, without increasing the speed. It provides for two-way progressive signal timing on the major crosstown streets and for progressive signal timing in one direction on the north and south avenues.

An essential feature of the plan is that the avenues will be grouped in pairs, with signals along one of each pair timed to favor southbound traffic, and along the other northbound traffic. This will have the effect of one-way operation, although the avenues will still allow two-way traffic, particularly in order to accommodate bus routes under existing franchises. Motorists proceeding in the direction opposite to that favored will find it desirable and effective to move over to the next avenue where the signal timing will be in their favor.

A shorter cycle length will provide progression on the major crosstown streets at a prescribed speed. This will effect a material reduction in delays and congestion on all the major two-way crosstown streets. Most of the minor crosstown streets, which are one-way, will also be materially aided. New controllers will be required at over 2,000 intersections in order to put the full plan in effect. It will take two or three years to perform the work, but a small portion is expected to be in operation this fall.

A sharp reduction in accidents is expected. The progres-

sive signal timing will eliminate many stops and congestion, both of which cause accidents. Pedestrian accidents should be reduced for the same reasons, together with the advantages of more frequent opportunities to cross and reduced waiting periods.

In addition to the off-street parking facilities to be provided by the new Parking Authority, the City Planning Commission added a new section to the Zoning Resolution. This section provides a new procedure liberalizing the Zoning Regulations to permit the construction of parking garages and other off-street parking facilities for 200 or more cars in any part of the city, upon approval by the Planning Commission and the Board of Estimate. Prior to this amendment, new garages could be established as a matter of right only in zoning districts where manufacturing and unrestricted uses were permitted. This change has encouraged new garage construction by private enterprise. The Planning Commission already has received a number of applications for such garage construction and has approved several. The entire Zoning Regulations are being reconsidered, and particular attention is being given to requirements for parking, loading and unloading facilities, and other factors that affect the traffic problem.

New York City is a fascinating place for traffic engineers. It covers the entire range of activity from the tremendous developments in Manhattan and theater areas, to the rural areas of Staten Island and Queens. It now has an agency devoting full time to traffic engineering, and programs are being expanded to make an all-out attack on the greatest of traffic problems.

How Essex County, New Jersey, Is Dealing With Its Traffic Problem

By R. W. Siver
Engineering Consultant*

THE NEED for vast improvement in traffic planning and operations, particularly in urban centers such as Essex County, New Jersey, has been fully demonstrated. Essex has one of the smallest areas of any county in the State, with only 125.5 square miles, or 1.67 per cent of the State's area. On the other hand, Essex County's population numbers 900,000 or close to 20% of the State's population, with nearly half of the population concentrated in Newark, the largest city in New Jersey and one of the major commercial and industrial centers along the eastern seaboard. Although there are 22 municipalities in Essex, for realistic traffic purposes the County is a large city, having its focal point within the City of Newark.

Essex County has only 36 miles (2%) of New Jersey's State highways, and none of these highways are continuous routes through the County. The result is that county roads and municipal streets provide the principal arteries of travel.

Essex County Takes Action

In 1946, under the guidance of County Engineer Curtis C. Colwell, the Essex County Board of Chosen Freeholders (the governing body for the County), took action to investigate the adequacy of its county road system. The County Engineer was authorized to employ a special planning engineer to investigate the conditions and lay the groundwork for a County Highway Plan. The investigations and planning which got underway in July, 1946, went "down to bedrock" and embraced population trends and studies, vehicle registrations, vehicle mileage, and family units and their distribution.

It was found that Essex County traffic would reach a probable figure of almost five billion vehicle-miles-per-year by 1970, which would be more than double the 1941 mileage.

Obviously, such traffic would not be uniformly distributed, but would stem from the population distribution and focus itself upon points of attraction such as business, industrial and recreational areas. In other words, there would be traffic desire lines. In January 1948, the first results from the Origin and Destination studies conducted by the New Jersey State Highway Department in conjunction with the U. S. Bureau of Public Roads, became available. These data were put to work to determine the location and magnitude of traffic movements which would have to be provided for.

During the analysis, a grid technique was employed for the Essex County area, with grid lines 2½ miles apart to facilitate analysis of traffic movements, demands and desire lines into and out of the grid areas and across the grid lines without reference to the existing roadway facilities. Out of this process, factors were evolved to determine the quantities of traffic to be expected by 1970. In addition to the quantities of traffic, the locations and direction of desirable traffic carriers were determined. Routes were laid down on paper with the number of moving traffic lanes required to accommodate future traffic loads.

Master Plan for Highways in the County

The routes laid down were then examined with respect to existing road facilities. The Essex County Highway Plan evolved from such studies, in substance, embraces about 250 miles of roads. The County Road System now embraces 189 miles. Of this mileage, about 18 miles are to be turned back to municipal jurisdiction. About 50 miles of existing municipal streets, not now part of the system, are to be transferred to the County jurisdiction. Of the existing streets and roads to be retained in the system, only 97 miles or 40% are considered adequate for future needs as to width. About 124 miles or 50% of the system must be

*Former Essex County Traffic Engineer

widened or otherwise improved, and 24 miles or 10% of the system will be new construction.

The Immediate Problem for Today's Traffic

The pressing problem confronting Essex officials now is what to do with today's traffic today and until such time as more highways can be built. The outlook shows that, even when all the carefully planned highways are built, about 80 per cent of the traffic mileage in Essex will be on streets which exist today.

It is obvious, therefore, that traffic operations on existing streets must be stepped up to more efficient usage of the facilities at hand. Essex County is making definite progress along these lines.

The Capital Improvement funds to be appropriated for new signals, signal modernization, and channelization amount to $427,000. This includes only the material costs in connection with the signal controls, inasmuch as regular County forces will take care of the installation.

In this program, 89 existing signals are being modernized, 35 new signals are being installed, 11 intersections are being channelized with permanent islands, and an electronic traffic-actuated cycle and offset selector system has been recommended for installation on one of the major east-west County roadways.

When completed, this electronic system will control 4.2 miles of roadway feeding traffic into and out of the City of Newark. It embraces 36 signalized intersections and will provide for preferential inbound and outbound movements, cycle change, and speed control by traffic actuation as the traffic demands indicate. This system has been recommended for installation on Central Avenue, a business street 60 feet wide from curb to curb for most of its length, which runs through Newark, East Orange, Orange and West Orange. Central Avenue now handles 25,000 vehicles per day.

This is but the beginning in Essex County. When the Central Avenue system is demonstrated under operation, the public will undoubtedly want such modern electronic control on every major route where it has application.

Regional Transportation and Terminal Planning for the New York - New Jersey Metropolitan Area

By Roger H. Gilman

Assistant to the Director of Port Development, The Port of New York Authority

THE EVER-INCREASING transport problems in the New York-New Jersey Metropolitan area, arising from the tremendous concentration of population, business, industry and commerce, have underscored the need for an agency capable of planning, financing, constructing and operating great public works on a *regional* basis. Because of the bi-state nature of the area, such an agency that would effectively represent both States in meeting these problems was necessary.

After several years of careful and penetrating research and analysis by a joint commission, the States of New York and New Jersey, by the Port Treaty of 1921, established The Port of New York Authority as their common agency, assigning to it the power and authority to plan, build, lease, and operate transportation and terminal facilities within the Port District, embracing areas of the two States lying within a radius of about 25 miles of the Statue of Liberty. The Port Treaty gave the Authority the further task of promoting and improving the commerce of the port. The two States also directed the Port Authority to maintain continuing liaison and to cooperate with other governmental agencies in the area concerned with such important matters of commerce as highways, channels, navigation rules, etc. Interestingly enough, the men who drew up the Port Treaty of 1921 clearly foresaw the tremendous increase in motor vehicle usage and highway construction that was to develop in the years following 1921 and directed the Port Authority to cooperate with the Highway Commissioners of the two States in developing a coordinated highway transportation system for the area which would assure direct connections with all bridges, tunnels, and ferries and permit the most efficient inter-relation between terminals, piers and industrial establishments for motor truck traffic.

In the twenty-nine years of its existence as the bi-state agency for the area, the Port Authority has spent over $350,000,000 in the construction of bridges, tunnels, airports, and marine and inland terminals for handling passengers and freight in the New York-New Jersey Port District. Its staff of 3,000 employees, under the direction of an unsalaried 12-man Board of Commissioners, are carrying out the provisions of the Port Treaty of 1921 in developing facilities designed for economical and efficient transportation.

Of paramount importance in the Port Authority program is the requirement that its facilities must be self-supporting. The Authority program thus relieves the already sorely pressed taxpayer from paying for these special transportation projects and frees tax monies of the cities, counties and states, which otherwise would have been required to pay for these special facilities, for other governmental services such as schools, parks, hospitals, streets, etc.

Interstate Tunnels and Bridges in the Metropolitan Arterial Highway System

In the mid 1920's, the rapid increase in highway travel showed a great need for interstate crossings of the Hudson River between New Jersey and New York City as well as interstate crossings of the Arthur Kill and Kill van Kull, the important waterways lying between Staten Island, one of the boroughs of New York City, and the New Jersey mainland, to provide quick and easy highway access between the two States. The development of interstate bridges and tunnels by the Port Authority at a cost of $240,000,000 was

undertaken to meet this need. Crossing the Hudson River are the Holland and Lincoln Tunnels and the George Washington Bridge while the Bayonne Bridge, Goethals Bridge and Outerbridge Crossing link Staten Island with the New Jersey mainland. Important as these bridges and tunnels are in themselves, the Port Authority recognizes that direct connections between these facilities and the arterial highways of the region are essential to provide the motorists with the transportation they require. Over $70,000,000 has been spent by the Port Authority in building viaducts, new express streets, depressed highways, subterranean tunnels, and other links so that traffic will flow freely and easily to and from these river crossings. In this way, the tunnels and bridges serve as special facilities integrated into the overall highway system.

This job of improving the traffic connections is a continuing one. Today, at the Holland Tunnel, almost 23 years after its opening, a new viaduct is being built by the Port Authority on the New Jersey side of the river to facilitate the traffic flow in approaching and exiting from the tunnel. At the George Washington Bridge a two-lane tunnel under 179th Street is now being built under local Manhattan streets parallel to the existing 178th Street tunnel, to provide separate tubes for traffic crossing upper Manhattan Island without touching local city streets. In the near future, the Port Authority and Triborough Bridge and Tunnel Authority will jointly build a new connection between the George Washington Bridge and the parkway system on the west side of Manhattan Island. At the Lincoln Tunnel, the Port Authority is providing a direct connection to the New Jersey Turnpike, now under construction.

Studies are constantly being progressed on the need for increased capacity to meet the growth of traffic which in 1949 reached a new peak of almost 53,000,000 vehicles moving between the two States via Hudson River bridges, tunnels and ferries. The new connections and plaza improvements for the existing facilities will be an important contribution to greater capacity. In addition, the bridges and tunnels themselves are being improved. In 1947, the Port Authority paved the two center lanes of the George Washington Bridge which had been left unpaved during original construction until the increasing traffic volume required the additional lanes. These two lanes, separated by medial

The New Jersey plaza of the Lincoln Tunnel, with special two-mile 6-lane approach roadway, built by the Port Authority to connect with major New Jersey highways.

Photo by Port of New York Authority

A portion of the 800-foot long platform at the New York Union Motor Truck Terminal, showing flat trucks with merchandise freight to be loaded into pick-up and delivery trucks.

Photo by Port of New York Authority

dividing curbs from the three lanes on either side of the bridge, are utilized in the preponderant direction of travel to provide five lanes of traffic for unbalanced movements during heavy peak periods of travel, such as Friday nights, Sunday evenings and Monday mornings. The eight lanes of the bridge are accommodating an ever-increasing travel which on peak days has exceeded 90,000 vehicles.

At the Lincoln Tunnel, which now consists of two tubes with two lanes in each tube, a study has recently been initiated to determine the feasibility of building a third two-lane tube, so that added capacity would be available to handle unbalanced traffic during peak periods by shifting its use to either direction.

In the past twenty-five years, the Port Authority has made several origin and destination surveys at the interstate bridges, tunnels, and ferries to determine the travel pattern showing the need and location for future crossings. In October 1949, some 135,000 motorists crossing between the two States were interviewed to provide information which will be basic to future plans of the Port Authority.

Terminal Facilities Relieve City Traffic Congestion

While bridges and tunnels have played an important part in the Port Authority's program for highway transportation, the development of proper terminal facilities has also been undertaken to relieve the congestion on city streets and lower the cost of transportation for the area.

The Port Authority is now building a $24,000,000 union bus terminal in midtown Manhattan to serve some 2,500 intercity buses which bring 60,000 New Jersey commuters into Manhattan each day. This terminal is to be completed by the end of 1950. It is designed with ramps providing a direct connection with the Lincoln Tunnel, through which most of the intercity buses cross from New Jersey. It will no longer be necessary for these buses to use Manhattan streets as they now do in traveling to and from the inadequate bus terminals scattered throughout the Times Square area. A parking space for 450 cars on the roof of the terminal will also have a ramp connection to the Lincoln Tunnel, thus precluding travel on surface streets by those cars.

(See REGIONAL TRANSPORTATION, *page 427)*

The Capacity of a Highway

By Dr. Victor F. Hess
Physics Dept., Fordham University, New York, N. Y.

It is of interest to learn how many motor vehicles can travel safety in one lane of a roadway for maximum efficiency. If we imagine a great number of cars standing bumper to bumper on a moving conveyor belt it is easy to see that there would be no limit to the number of cars which could pass at a chosen spot per hour except for the limitation in the speed of such a conveyor belt.

However, if cars are moving individually on a highway and even if no driver is allowed to change his lane (as for instance in tunnels or on bridges), it is clear that a safe space must be allowed between each car and the car ahead. This safe space naturally increases with the speed of each car.

Let us assume (ideal case) that each driver is instructed to maintain the same speed and to observe a certain safe distance between his car and the one ahead.

This "safe distance" really consists of two parts: First, the distance a which would be covered within the so-called "reaction time" t (time interval between the stop signal observed visually and the moment when the brakes are applied) and, second, the distance b covered while the brakes are acting, i.e., "braking time."

The distance a is, naturally, proportional to the speed of the car v.

$$a = vt$$

For instance, if we take—as an average—a reaction time of 0.75 sec., the car would roll on, unchecked, for a distance of 30 feet, if it is moving at a rate of 40 ft. per second.

The distance b covered during the "braking time" is proportional to the square of the velocity of the car, depending very much upon the surface of the road and the condition of the brakes. But generally we can assume $b = kv^2$, where k is a coefficient (friction) which may vary within wide limits.

In order to get a fair estimate the author wrote to the Automobile Club of New York for recommendations of what could be considered as "safe distance" between two cars following one another, under average road conditions (dry concrete surface). The answer was: "A driver with an average reaction time (0.75 sec.) should stay at least 20 feet, or slightly over one car length, behind the car he is following *for each 10 miles per hour of his speed*".

This would mean 20 feet at 10 miles per hour, 40 ft. at 20 miles per hour, 60 ft. at 30 miles per hour, etc. This rule, however, does not take into account the fact that the braking distance b is increasing approximately with the square of the velocity of the car at the instant when the brakes are applied.

The total "safe distance" between two cars is, therefore,

$$a + b = tv + kv^2$$

where t is the reaction time (average 0.75 sec.) and k a coefficient which has to be found by experiment.

Upon inquiry the Automobile Club of New York informed me that "figuring that the brakes just meet the requirements of the Uniform Vehicle Code (44.5% efficient) a car traveling at 25 m.p.h. would have a 'reaction-time-distance' of 27.5 feet plus a 'braking distance' of 46.9 feet or a total stopping distance of 74.4 feet".

Taking this "braking distance" 46.9 feet = 14.3 meters for this particular velocity, we can derive a value for the coefficient k

$$b = 14.3 = kv^2$$

Taking for v, 25 m.p.h. = 11.17 meters per sec., we obtain,

$$k = \frac{14.3}{124.6} = 0.115 \ \frac{\text{sec}^2}{\text{meter}}$$

From a graph given in "The Motorist," February 1950, p.8, similar values (0.08 to 0.10) can be derived, all pertaining to a dry concrete surface. The following table gives a comparison of the "safe distances" between two cars following each other at various velocities; column A gives these distances as computed from the rule cited above ("add 20 ft. for each additional 10 miles per hour") and column B the safe distances computed from the formula $tv + kv^2$, using for t (reaction time) 0.75 sec and for the coefficient k the value 0.115, as derived above.

Speed (miles per hour)	Safe Distance betwen Cars (feet)	
	A	B
10	20	18
20	40	54
30	60	120
40	80	164
50	100	242

It is evident that the quadratic law gives much greater values.

The actual distance to be allotted for each car in one lane is the sum of car length (L), or reaction time distance (vt), and braking distance (kv^2):

$$D = L + vt + kv^2$$

If all cars are traveling at a speed v, the time necessary to covered this distance D is $\frac{L + vt + kv^2}{v}$ and this is also the time interval between two successive cars passing at a chosen spot (for instance the entrance to a tunnel). The number of cars passing this spot per second is therefore

$$n = \frac{v}{L + vt + kv^2}$$

and the number of cars passing per hour (capacity of one lane of the road)

$$N = \frac{3600v}{L + vt + kv^2}$$

This formula allows us to compute the number of cars which can be handled by each lane of a highway, under

favorable conditions, for any chosen speed.

It is now of great interest to find out if there is an optimum speed; that is, if there is a speed at which the greatest number of cars can pass at a given spot.

Mathematically this question can be solved very easily: If N is to be a maximum, the first derivative $\frac{dN}{dv}$ must be zero. Therefore we differentiate N with respect to v and obtain:

$$\frac{dN}{dv} = 3600\left[\frac{1}{L + vt + kv^2} - \frac{v\,(t + 2kv)}{(L + vt + kv^2)^2}\right] = 0$$

$$\text{or} \quad L + vt + kv^2 = vt + 2kv^2$$

$$v = \sqrt{\frac{L}{k}}$$

The optimum speed, therefore, depends only upon the average coefficient k and the length of a car, and does not depend on the reaction time. Taking $k = 0.115$ and $L = 5$ meters (15 feet), we get $v = 6.6$ meters per sec. or *14.8 miles per hour.* For $k = 0.08$ the optimum speed would be 7.9 meters per sec. *(17.6 miles per hour).* Thus we see that a very moderate speed (on a concrete surface) of from 15 to 18 miles per hour would give the best efficiency of the road. The author is certain that most motorists will not be pleased to travel at this speed for any length of time.

In order to illustrate that at this speed the capacity of the road is greatest the author computed (see the following table) the actual number of cars (average length L assumed to be 5 meters = 15 feet) which can pass per hour at any chosen spot. The formula $N = \frac{3600v}{L + vt + kv^2}$ was used, based on the chosen value $k = 0.115$ and reaction time (average) 0.75 sec.

Speed (miles per hour)	N (Number of Cars Per Hour for Each Lane)
4.5	1034
9	1464
13.4	1584
14.8	1590
17.9	1570
22.4	1500
26.7	1415
33.6	1280
45	1080
56	854

It can be clearly seen that at about 15 m.p.h. the capacity is greatest (1590 cars per hour on each lane), but the decrease at greater velocities is not very noticeable at first so that up to 25 m.p.h. the road shows still a capacity of about 1450 cars per hour (90% of maximum capacity).

If the road leads to a toll gate it is clear that the cars would arrive in intervals of $\frac{3600}{1500} = 2.4$ sec. and therefore at least two toll gates are necessary, if we assume that about 5 seconds are necessary to pay the toll and then to proceed, without delaying the cars behind.

Toll gates in the New York Metropolitan area are designed in this manner: for three lanes at least 6 toll gates are provided and manned during the rush hours.

We can, therefore, estimate the maximum number of cars entering Manhattan from New Jersey through the two tunnels (4 lanes) and the George Washington Bridge (4 lanes) in the two morning rush hours: Assuming all lanes filled to capacity, moving at 25 m.p.h., we would have $2 \times 8 \times 1500 = 24000$ cars entering Manhattan in two hours.

From the formula for the capacity of each lane $N = \frac{v}{L + vt + kv^2}$ we see that the length of each car reduces this capacity quite effectively at lower speed and becomes insignificant only at speeds of 45 m.p.h. and over.

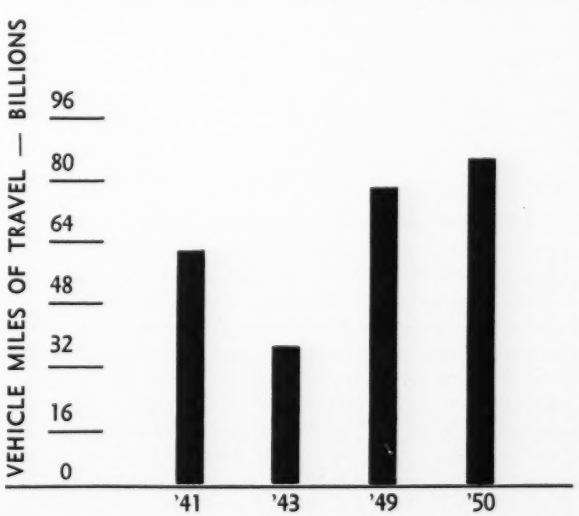
It can be shown that if we would assume the braking distance is proportional to the velocity (not to the square of the velocity) no maximum capacity can be found, which is, naturally, nonsensical, since it is in contradiction to actual conditions.

We also can conclude from the formula of the capacity of the road that if the braking distance is doubled (slippery road) the capacity is reduced: at 20 m.p.h. the road capacity would be only 1100 cars per hour (instead of 1500), at 45 m.p.h. only 600 (instead of 1100). The optimum speed (with $k = 0.23$) would be reduced so

$$v = \sqrt{\frac{L}{k}} = \sqrt{\frac{5}{0.23}} = \sqrt{21.8} = 4.7 \text{ m/sec.} = 10.5 \text{ m.p.h.}$$

(Note: The author wishes to thank Mr. Martin Klein, Director, Traffic Engineering and Safety, Automobile Club of New York, for supplying the data on which the computations are based)

Traffic Trends



TRAVEL ON RURAL ROADS FOR FIRST FIVE MONTHS of 1941, 1943, 1949 and 1950.

Based on Bureau of Public Roads Data

Some Common Municipal Traffic Problems and Their Solution

By Wayne N. Volk (Mem., ITE)
Traffic Engineer, State Highway Commission, Madison, Wisconsin

I SCARCELY have to relate that the great majority of the larger municipalities are suffering from hardening of the arteries—that is, the traffic arteries. Merchants, city officials, and traffic engineers are trying to arrest and reverse this hardening—to promote the reasonably free flow of traffic through the arteries of the city in order to maintain and promote the proper commercial and cultural development of the community.

Terminal Facilities Are Greatest Need

I submit that the greatest traffic need in cities of all sizes is terminal facilities. By the expenditure of from a few thousands of dollars to many millions of dollars we can greatly facilitate the flow of traffic on our present street system or we can build safe and high speed expressways. Either activity, depending on the situation, will make it relatively easy for motorists to reach their destination in the business district, which in most communities is not capable of absorbing the present vehicular volume terminating in the area, let alone the additional traffic almost certain to be generated by the improved access facility. These improved traffic arteries will bring in more traffic, and make the trip easier and quicker.

But where will the cars be put while the drivers are conducting their business?

Thus it appears that terminal facilities are a vital part of the over-all traffic problem and that the maximum good cannot be obtained from increased fluidity of traffic movement unless more adequate provision is made for terminal facilities for the vehicles. Someone has said very pungently that "people can't be customers until they get their feet on the pavement." Vehicles circling around the block looking for a parking space represent both unsatisfied potential customers and unproductive sources of traffic congestion.

Off-Street Parking Essential

Naturally "terminal facilities" in the case of private passenger vehicles merely means "parking spaces." Parking is a national headache which is being studied, attacked and alleviated in a number of different ways in many communities. The parking problem is so big and complex that I will not attempt to go into detail, especially since so many complete, authoritative and helpful publications on the subject are on your desks or available to you. I would just like to mention, however, that it is almost universally acknowledged that off-street parking is the only complete answer to the whole problem. Beyond that lies a complex economic and traffic problem which includes such considerations as ground level lots versus open air garages or closed buildings; municipal versus private ownership; free parking, subsidized facilities, and self-supporting projects; parking facilities at the business area versus outlying lots with commuter transportation; and many other problems. No one plan is satisfactory for all communities, but the important thing is to try to foresee parking requirements and set about meeting them while at the same time providing for improved street traffic operations.

Terminal facilities for mass transportation vehicles deserve a great deal of serious consideration. Buses, trackless trolleys and street cars carry many more passengers per unit of street area than do private passenger vehicles. If the passengers on such mass transportation vehicles were to use private cars, the congestion on the streets of many communities as well as parking conditions would be well nigh intolerable. Many authorities feel that travel by mass transportation vehicle is so important in alleviating traffic problems that more effort should be put forth to make the service attractive to a larger proportion of the persons who must enter and leave the business districts each day. This can be aided by terminal facilities easily reached by customers and vehicles alike, and so located as to best serve the greatest number of potential users.

Terminal facilities for transporters of merchandise, both rail and free wheel, should also be given more consideration. The movement of goods as well as of passengers is of prime importance in an economically healthy community. Ready access to such facilities should be provided from major rural highways as well as important city streets available to trucking. Terminals should be so situated that unnecessary movement of large trucks through the city is eliminated, so that cross-haul is cut to a minimum and so that deliveries can be made quickly and economically. Streets choked to stagnation with trucks represent a tremendous economic loss, which in the last analysis is borne by the community.

Curb Parking

In many communities curb parking forms a substantial or even major part of the terminal facility for private passenger vehicles. The pressure to retain curb parking spaces becomes tremendous in such communities, yet it is becoming clear that the street is primarily for traffic movement and not for storage. In some cities local authorities take the view that it is impossible to provide off-street parking at reasonable costs, so that regulatory measures are instituted to increase the use of curb space by decreasing the length of time that a car can occupy a given parking space. While such devices are necessary as an interim measure, they do not solve the problem.

There is not sufficient space at the curb in any community of any considerable size so that parking needs can be satisfied.

Furthermore, curb parking is being retained on many

traffic arteries where the demands of moving traffic require the elimination of parking to improve traffic movement. One of the methods of providing additional space for moving traffic at peak traffic periods (usually from 4 to 6 P.M.) is by the elimination of parking on one or both sides of the street for that critical period. This valuable device, which has been given too little consideration to date, has shown astounding results in increasing street capacity and reducing congestion. Curb parking not only occupies street space, but the maneuvers incident to entering and leaving parking spaces encroach upon lanes for moving traffic and so hamper the full utilization of the available street space.

Diagonal parking, except on the widest streets carrying only moderate traffic is outmoded and should be eliminated. The amount of street space required for diagonal parking and necessary maneuvering far exceeds the benefits from the additional parking spaces. Accidents involving parked cars likewise are much more frequent in the case of diagonal parking and accidents represent a direct and considerable monetary loss to the individual and community.

Street Lighting

Pedestrians represent the major accident problem in urban communities. Two-thirds or more of the urban fatalities are pedestrians. Thus it follows that anything reasonable which can be done for the protection of pedestrians and the facilitation of their movement will react favorably on the accident rate.

One of the most important pedestrian safeguards is adequate street lighting. The improvement in accident experience following the installation of modern street lighting has been demonstrated too often to need emphasis here. Night motor vehicle accidents as well as pedestrian accidents are reduced markedly where lighting is brought up to the standards set forth by the Illuminating Engineering Society, as approved by the Institute of Traffic Engineers and the American Standards Association, yet many Wisconsin communities still have pitifully inadequate lighting. In too many places, antiquated street light units direct the light upward toward the sky instead of down onto the pavement. In other places, the luminaires do not fully utilize the light output, either through poor design or lack of maintenance, so that the money spent for street lighting is used to the best advantage.

Channelization of Traffic

Channelization of large or complicated intersections is a proven method of preventing accidents and facilitating and directing the movements of vehicles and pedestrians. A pedestrian out in heavy traffic in a wide roadway or intersection is a pitiable object. Rare indeed is the motorist who will yield the statutory right of way to a pedestrian, who must watch for traffic from many directions.

The introduction of properly shaped and positioned islands provides pedestrians with a place of refuge, and are also a means for controlling and directing conflicting traffic movements. Medial pedestrian islands at intersections, especially where pedestrian traffic is heavy, or where the volume of right and left-hand turns is considerable, have proved to be of great help not only to pedestrians but also in promoting the orderly movement of traffic. Under many conditions the use of such islands will make a traffic signal unnecessary while giving greater protection to pedestrians than provided by a signal.

Pedestrian and channelization islands should not be hazardous to motorists. Every effort should be directed to making the right thing to do, the easy thing to do. This means that islands should be well marked and lighted, should reasonably protect pedestrians without being hazardous to motorists and should be so designed and positioned that they guide traffic movements into desired channels. This usually requires careful study and sometimes trial installations with flexible and portable materials, such as sacks of sand to outline the proposed islands before their construction from permanent materials.

Traffic Signals

Traffic signals are much over-rated as control devices. Whenever a serious accident occurs at an intersection, the cry is "Put in a Traffic Signal." Actually it is not uncommon to find that accidents begin to become a problem only after the installation of a traffic signal following a popular demand because accidents might happen there, and "Are you going to wait until someone is killed before you do something?"

Actually, traffic signals are more beneficial in increasing street capacity under certain conditions than they are in preventing accidents. The Highway Commission, which must approve all traffic signal installations on state trunk highways, whether in municipalities or on rural roads, uses the nationally recognized warrants or criteria set forth in the Manual on Uniform Traffic Control Devices for Streets and Highways in determining whether or not a traffic signal is really needed at a given location. These criteria, including minimum vehicular and pedestrian volumes, accidents, etc., could well be used by all communities to provide objective bases for determining whether or not to install a traffic control signal.

Traffic signals delay traffic and frequently increase instead of decrease accidents. Every effort should be made to avoid their use by improving conditions at busy intersections. Some typical improvement measures are:

1. Keep parking well back from the crosswalk—at least the the statutory 15 feet and preferably farther.
2. Install better and more effective arterial "Stop" signs on the minor street, reflectorizing them for night visibility or adding a flashing red signal for added effectiveness, if warranted.
3. Install channelizing or pedestrian islands, especially on wide streets or complicated intersections.
4. Improve the street lighting.
5. Change location of bus stops, if possible, where these require pedestrians to cross the street to transfer to another bus line.
6. Post statutory speed limits conspicuously on the major street.
7. Provide officer control for short periods when warranted.

It is frequently the practice of police officers to operate traffic control signals by hand during peak traffic hours. Although a really alert and well-trained officer can get more traffic through the intersection by manual operation, in most instances he does a poorer job than the signal operating automatically. In almost every instance the officer should confine his activities to supplementing the traffic control signal by urging laggards to greater speed, by assisting pedestrians, by facilitating turning movements, and in general, by keeping traffic moving smoothly in accordance with the signal indications.

In several Wisconsin communities there are systems of traffic signals along one or more streets where the signals are not coordinated. This may put a premium on speed so that as many signals as possible may be passed during one green interval, or it may necessitate several stops for the red light, resulting in congestion and lost time. All signal systems should be coordinated insofar as possible to permit vehicular movement at a reasonable controlled speed through the system.

One-Way Streets

Many cities are experiencing important relief from congestion by the use of one-way street systems. Because of the lack of interference from opposing traffic as well as better traffic signal timing, one-way streets can carry considerably more traffic than two-way streets of comparable width. Accidents are usually less on one-way streets than on two-way streets. Naturally, to be satisfactory, two parallel streets having adequate width and pavement must be available for conversion to pairs of one-way streets. Such streets must be of considerable length to be of any real value and must be readily accessible with adequate connections at each end.

Opposition to one-way streets is usually encountered, especially where business districts are involved. Such facilities, however, do not seem to have the adverse effect on business that is usually anticipated by the property owner, and the reduction of congestion and improvement of access seem to be positive factors offsetting the anticipated ill effects. This device (one-way streets) should have a wider use in improving the traffic capacity of streets.

Use of Accident Records

In checking the accident files of police departments for records of accidents at urban intersections, we have found that a great deal of improvement could be made in the collection and use of these valuable records. In many cities the report is very sketchy and gives little information as to why (or sometimes even where) the accident occurred. Furthermore, the reports are so filed that it is difficult to find out where the accidents are occurring. I must urge that more accurate and adequate reports be obtained and that they be properly filed so as to be of maximum utility in locating and treating high accident locations. Proper construction and control devices cannot be decided upon without accurate knowledge of the accident record, and this is available and in use in only a very small percentage of our communities.

School Crossing Protection

The protection of school children is a very pressing and controversial problem in many communities. This problem is often approached from a very emotional standpoint, which is natural under the circumstances, although it is not necessarily the best approach to any problem. It goes without saying that children deserve the utmost protection not only at or near the school but also wherever they may be. Actually we are under the greatest pressure to provide extra safeguards at schools and school crossings, whereas the fact is that the vast majority of children are injured while crossing or playing in streets near their homes before or after school hours, and that the number injured at or near schools is negligible.

The state legislature has given serious consideration to the problem of protecting school children, and it is their decision, as expressed in the Statutes, that vehicles should not pass schools or school crossings at a speed greater than 15 miles per hour "at such times as children are going to or from school, or are playing within the sidewalk area at or about the school."

This is a very restrictive requirement and, if observed, should preclude any accidents involving school children. We feel that stopping all traffic at schools or school crossings is unreasonable (especially since such stops are often left in place all day) and that such school stops are psychologically undesirable from the standpoint of the child. He has to watch traffic carefully and usually has to yield the right of way to vehicles at the many intersections he crosses on his way to and from school. Protection is usually provided only near the school, and to allow him practically uncontrolled right of way at the school or school crossing may be poor psychology. We feel that it is far better to give motorists adequate warning of the school or crossing, to require obedience to the statutory speed limit, and to give adequate guidance to the children by school boy patrols or by a traffic officer where conditions warrant.

Uniform Signs and Signals Required

In compliance with the requirements of the Statutes, the State Highway Commission has issued two sets of regulations on signs, one of which is on school signs. Under the Statutes, all school signs throughout the state must conform to the standards established by the Commission. The standard "School" sign is now a yellow diamond-shaped board bearing the word "School." The red, white and blue "Caution—School Zone" signs are approved until their replacement is required due to deterioriation. Other signs described in the regulations include: "Drive Carefully In School Zones," "School Crossing," and "15 Mile Speed Limit When Children Are Present." Copies of this booklet are available from the Highway Commission offices.

The other regulation deals with the "Design, Installation and Operation of Traffic Control Signals and Stop Signs." The Statutes require that all traffic control signals and stop signs shall conform to the regulations of the Commission effective January 1, 1950. Copies of this regulation are also available from our offices.

Conclusion

I wish to conclude with the urgent suggestion that traffic problems be attacked not from the standpoint of adding more restrictions, but rather with the idea of providing for better and safer flow of traffic. Traffic is much like a stream of water in that if blocked it will go elsewhere or will build up until the pressure reaches dangerous proportions. Many improvements such as channelization, one-way streets, coordinated signal systems, rush-hour parking prohibitions, to name a few, can and should be made before the impediments in the traffic stream reach dangerous and costly proportions.

Reprinted from **THE MUNICIPALITY**

A contract for 60 forty-eight-passenger electric trolley coaches has been awarded to the Marmon-Herrington Company of Indianapolis by the Municipal Railway System of San Francisco, according to James H. Turner, manager of the system. Delivery is scheduled for early December for use on the Sutter and Stockton lines.

Recently Colonel Marmion D. Mills, transit expediter for Muni Railways, declared that conversion to trolley coach operation should provide a $50,000 monthly operating profit for the system and urged more rapid conversion to these vehicles. This order is the first since Col. Mill's recommendations last March to Philip F. Landis, president of the Public Utilities Commission. Further trolley coach conversions are planned shortly.

Channelizing A Heavy Traffic Artery

By Rex G. Still (Assoc. Mem., ITE)
Principal Assistant Traffic Engineer, Washington State Dept. of Highways

THE TERRIFIC accident and fatality rate, and the rapid increase of vehicle volumes resulting in congestion on highway systems during the past few years has created a disturbing problem for traffic and highway engineers.

In an endeavor to correct this accident trend and to relieve the congestion, the State of Washington is constructing channelization facilities at many intersections and through congested communities on its rural highway system.

Channelization is designed to control streams of traffic in order to eliminate conflicts, expedite traffic flow and provide safety of movement. It puts vehicles in the proper lane of traffic by construction of islands with white reflecting concrete curbs which are visible at night as well as during the daytime. While channelization will not eliminate all accidents, proper design, as has already been proven in many localities, will substantially reduce the head-on collision, the rear-end collision, and the left turn and U turn collisions. Channelization also provides a great deal of additional protection to the pedestrian when crossing major thoroughfares. If these types of collisions can be eliminated, the accident rate will be greatly reduced.

In addition to being very beneficial in reducing accidents, channelization will reduce congestion to a great extent by the provision of left turn lanes and prohibition of left turns at certain intersections. Existing highway facilities in the State of Washington are now becoming very congested, as traffic is increasing very rapidly. It is a very difficult engineering problem to control the traffic on major thoroughfares which have limited right of way widths. However, it can be done by channelization and other control devices, which will result in providing the vehicle operators a safe and rapid means of transportation through these areas.

The construction of channelizing islands has been greatly criticized by adjacent business establishments. Although all business survives on transportation, some business establishments feel that channelization control is detrimental to their business. Of course most of this criticism, aimed at the State, was based on misinformation and partly on misrepresentation. In order to accomplish the desired control, channelizing islands quite often must be constructed to prevent improper turns to business establishments. Before the reconstruction of a section of highway, State traffic engineers meet with representatives of the communities to explain to them the benefits derived by channelization control. Their patrons as well as others benefit by being provided a safe means of access at certain locations as well as the removal of congestion and improper movement of vehicles through the reconstructed area.

Reconstruction and Channelization of U. S. 99

In 1947, the State reconstructed a section of U. S. 99 (Aurora Avenue), starting from the north city limits of Seattle (No. 85th Street) for a distance of one and one-half miles north (to No. 115th Street). This area has been built up with a ribbon construction of business establishments. The 37½ foot width of pavement placed in the center of a 90 foot right of way width was inadequate to carry the volume of traffic desirous of using this thoroughfare. Conflict and accidents occurred due to congestion, improper parking, and turning movements to and from the business establishments.

Fig. 1

This section of U. S. 99 is paralleled by streets on the west and east sides and is interconnected by transverse streets at block intervals. To provide protection to vehicles making a left turn and to prevent other improper movements as well as relieve congestion, this section was completely channelized to provide left turn protection at every fifth block plus one additional block between each five block spacing. By using this type of design, the channelizing islands are constructed close enough together so that, at the angle from which you observe them when driving a vehicle, the edge of the islands appear to form a continuous line.

The right of way width of this section of U. S. 99 being only 90 feet, this reconstruction project was designed with four twelve-foot lanes, two eight-foot parallel parking lanes, seven-foot curb and sidewalks, with a twelve-foot curbed median island split by the center line. The median and left turn lanes were curbed with White Reflecting concrete curb 5¾ inches high. The left turn lanes were separated from the through lanes by White Reflecting concrete buttons twelve inches in diameter. Figure No. 1 shows the positioning of the left turn lanes, which straddle the center line. Figure No. 2, "Before and After" shows the improvement looking north from the same location as Figure No. 1. Figure No. 3 "Before and After" clearly indicates that parking, even on private property where the buildings are set back, has been controlled by this reconstruction project. As shown, the pedestrian, when walking in the marked pedes-

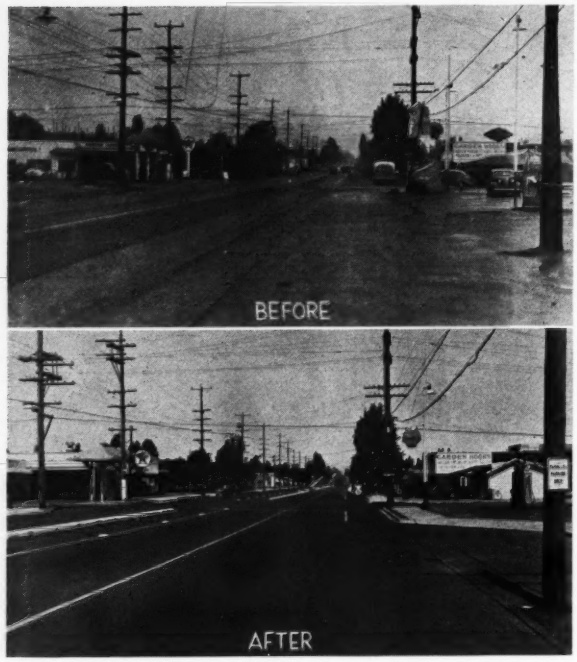


Fig. 2

trian crossing, has refuge on the island section in the center of the four-lane pavement.

Meeting the Opposition

Immediately after construction of the asphaltic concrete surfacing and curbs and gutters was completed, the contractor began to install the channelizing islands. As soon as this operation was begun, petitions were sent to the Director of Highways protesting the installations of the traffic islands and requesting that they be removed. These petitions, from the local business groups where this project was underway, contended that the islands were causing traffic accidents, business losses and inconvenience. Representatives of the Traffic Department met with these groups and explained to them that this reconstruction project was designed to improve a very congested section of highway with a high accident rate and would provide a safe freeway for north and south bound vehicles that pay for a high standard type of highway by the purchase of vehicle licenses and gasoline. It was very evident that the protestants were reluctant to be denied the improper use of a public thoroughfare that they had enjoyed for some time. It was explained to them that although certain turning movements were prohibited that protected turns were constructed that would provide a safe circular movement of traffic for their patrons. The construction of the islands was expedited as much as possible in an endeavor to complete the channelization so that it could be given a fair trial of operation. Figure No. 4 "Before and After" shows the improvement made by this reconstruction project which should tend to increase the valuation of adjacent business property.

A short time after this project had been completed, a member of the Traffic Department was invited to attend a meeting of the Transportation Club in Seattle. Attending this meeting were owners and operators of large mass transportation and heavy hauling companies. During this meeting, the presiding officer asked the group to express their feelings as to the channelization of Aurora Avenue north of Seattle, as most of them operated equipment over this section of U. S. 99. The group gave unanimous endorsement to the project. This, of course, was very gratifying to the traffic engineer in attendance. At the conclusion of the meeting, several members contacted the traffic engineer and requested that similar channelization treatment be given to other areas on the State highway system.

Adverse critics are usually quite reluctant to express appreciation of a project to which they have been opposed. However, through roundabout ways some of the main objectors of the channelization of Aurora Avenue have expressed their opinion that the reconstruction of this section of highway had *not* been detrimental to their business and that traffic conditions had been greatly improved.

Improvement Noted

The contract price for the widening, drainage, asphaltic surfacing, construction of curbs and sidewalks and channelization islands was $112,500.00. The cost of the channelization was $17,500.00.

An accident analysis of this section of highway was made covering a period of one year before the reconstruction and one year two years after the channelization was installed. While the number of accidents decreased from 127 to 90 after channelization, a decrease of 29 per cent, the traffic volumes increased from 16,000 to 21,000, making an accident rate per million vehicles miles of 14.50 before and 6.76 after, a decrease of 53 per cent. Personal injury accidents were greatly reduced, there being 45 injured prior to channelization and 16 injured during the second year after channelization. Property damaged decreased from $22,000 to $13,100. The economic loss before was $88,100 while during a similar period two years later it was $59,960. Non-intersection accidents decreased 57 per cent after channelization. Forty-one of the "before" accidents and thirty-four of the "after" accidents occurred at the intersection of Aurora Avenue and North 105th Street where a two-phase fixed-time traffic control signal was installed. At this intersection

Fig. 3

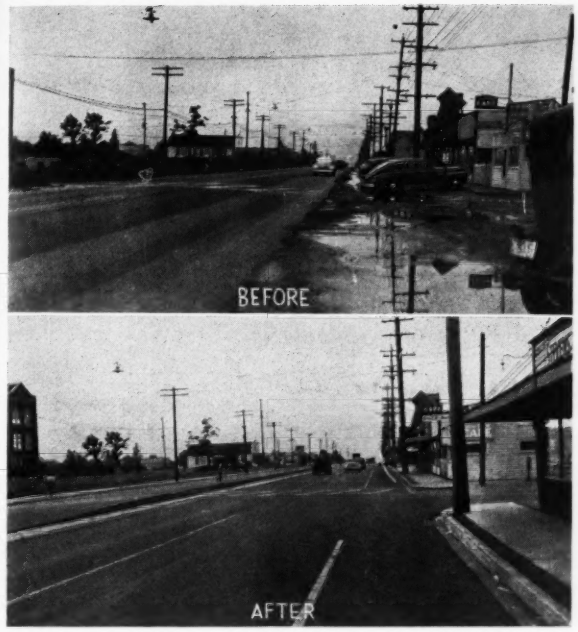


Fig. 4

there is a heavy left turn movement that caused conflicts when controlled by a two-phase signal. There is now installed at this location a three-phase traffic-actuated signal which will remove the conflicts and decrease the accidents at this location.

A review of the accident analysis indicates that the construction of channelizing islands and controlled parking has greatly decreased the economic loss and provided a non-congested and safe thoroughfare for vehicles and pedestrians using U. S. 99 for a distance of one and one-half miles north of the Seattle city limits.

REGIONAL TRANSPORTATION

(Continued from page 419)

Motor vehicle freight transportation is also receiving attention in the Port Authority program. Two union motor truck terminals, one in lower Manhattan opened in November 1949, and the other in Newark to be opened in the summer of 1950, provide 1,000-foot platforms for the consolidation, sorting and interchange of merchandise freight between the terminal tenant carriers' over-the-road trucks and the pickup and delivery trucks which furnish a consolidated service for all tenant carriers. Each of the two terminals, with a capacity of 2,000 tons per day, has off-the-street loading berths for about 150 trucks, as well as ample parking space for trucks on the roof or on adjacent property.

For rail freight, the union railroad freight terminal, located in the Port Authority Building, permits the consolidation on one platform of l.c.l. freight for the eight trunk-line railroads and does away with the necessity for consignees and shippers to truck their package freight to and from the separate stations of each of the railroads in picking up or delivering their shipments.

An essential part of modern piers and cargo terminals designed for handling waterborne cargoes is sufficient space in which trucks can maneuver while loading or unloading freight, as well as in moving to and from the piers. At the request of Governor Driscoll and Mayor O'Dwyer, the Port Authority has surveyed the waterfronts of New Jersey and New York City, respectively, to determine possible marine terminal developments. The recommendations for new pier construction as well as existing pier rehabilitation recognize the importance of adequate space for the large trucks in use today and include such features as space for loading and unloading trucks off the marginal waterfront streets, wide U-shaped aisles running the length of the pier for truck movement, and berths on the pier for loading and unloading of trucks near ship's tackle.

The Port Authority's program for developing and operating the four metropolitan airports in the area—La Guardia and New York International Airports in New York City and Newark and Teterboro Airports in New Jersey—requires adequate highway travel facilities both within the airports and on the approaches to these air terminals. Close liaison has been maintained with the New York City Construction Co-ordinator and New York State Department of Public Works on the construction of the Van Wyck Expressway which will provide a direct and convenient route between Manhattan and New York International Airport, the world's largest airport. Similarly, on the New Jersey side, the Port Authority's staff has kept in close touch with the New Jersey State Highway Department, New Jersey Turnpike Authority and City of Newark on both present and proposed access facilities to Newark Airport, which is now being substantially enlarged and rebuilt to serve the needs of expanding air travel.

Cooperation Brings Results

It is of the essence in the planning of such vast public works in the New York-New Jersey Metropolitan area that close cooperation be maintained with the highway and traffic engineers of all governmental units and agencies in the region. Survey results have been exchanged, joint highway projects undertaken, and research work coordinated between many agencies. This collaboration and liaison has proved most fruitful in achieving a coordination and integration which has contributed greatly to the ease, economy and efficiency of highway transportation for this metropolitan area.

Goodbye To Blowouts

A puncture-sealing tire that has no tube and a tube so strong it can be used without a tire in emergencies, are recent advances by tire firms.

The tubeless tire, made of new long-wearing "cold rubber," has a gummy interior that keeps nails or other objects from causing loss of air when they puncture the tire.

And the new tube, while meant for use with tires, has nylon cords for extra strength. If punctured, it leaks air very slowly. It is said to last the life of three tires.

Parking Lot Thefts Decrease After Relighting

Since a parking lot area in Quincy, Massachusetts, was relighted and brightened there has been a noticeable decrease in the number of reported thefts from automobiles, Chief of Police Joseph F. Hughes reported to The Street and Traffic Safety Lighting Bureau. Previously there had been several larcenies of accessories and other articles from parked cars.

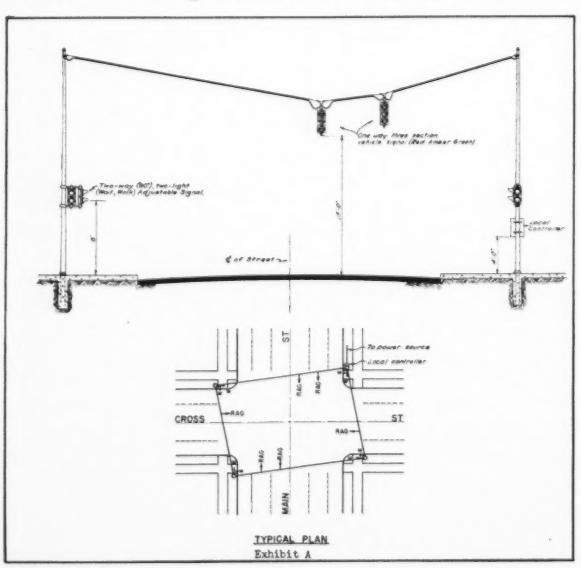
By J. Al. Head
Asst. Traffic Engineer
Oregon State Highway Department

Louver Installation for Traffic Signal Heads

THE JANUARY, 1950 issue of Traffic Engineering, under the heading, Reference Notes, on page 166, contained a very excellent article on "Positive Signal Control" prepared by Victor G. Hofer (Member, ITE), Traffic Engineer, Chicago Park District, setting forth the method developed by the Chicago Park District Traffic Section for giving positive signal indications and precluding the possibility of motorists "jumping the gun" on amber indications from the side street signal. This method of giving a positive signal indication is excellent; however, it is felt that the method as developed and used throughout the state of Oregon would also be of interest.

The need of separating vehicular and pedestrian signal indications was recognized by the late John Beakey (Member, ITE), former Traffic Engineer for the Oregon State Highway Department, and Fred T. Fowler (Member, ITE), Traffic Engineer for the City of Portland, as far back as 1940. It was the consensus of these two men that the pedestrian Wait-Walk Signal could best serve its purpose if it were mounted directly in line with the crosswalk and at a minimum height and completely divorced from the vehicular signal. Likewise, the vehicular signal could be a more positive and individual indication to the motorist if it were mounted overhead above the far crosswalk and directly in the line of sight of the motorist. This is illustrated in Exhibit A, "Typical Plan for Traffic and Wait-Walk Signals."

The first such installation in Oregon was made in the City of Klamath Falls in December of 1941 at five intersections in the central business district. The success of this system was immediate, not only from the standpoint of observance of signals, but in the reduction of accidents and the ease with which pedestrians and motorists utilized the intersection. Subsequent to this installation, all installations in the State of Oregon, both urban and rural, have been of this standard. Under such a scheme of signal control, the Wait indication to be directed to the pedestrians starts several seconds prior to the amber indication of the vehicular signal directed to the motorist, thus allowing additional green indication for the motorist and yet the intersection is cleared in the same length of time.



TYPICAL PLAN
Exhibit A

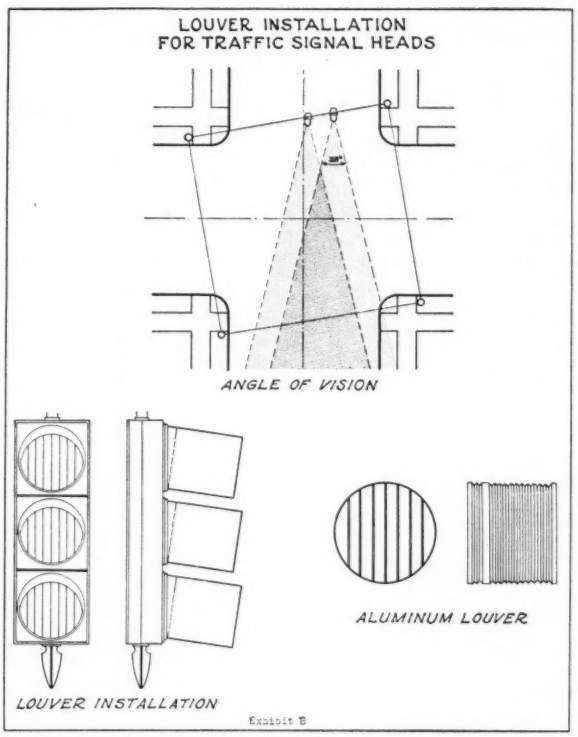


Exhibit B

Under this method of installation some motorists "jumped the gun" by watching the indications from the side street signals, and pedestrians refused to be controlled by the Wait-Walk signals. Fred T. Fowler, Traffic Engineer for the City of Portland, developed a louver to be installed in the traffic signal heads which would restrict the angle of vision with respect to the traffic signal to a minimum, yet such minimum being adjustable to conditions existent at the particular intersection. Exhibit B pictures a "Louver Installation on Traffic Signal Heads" illustrating the angle of vision as well as giving the detail of the aluminum louver and the method of installation thereof.

These louvers are manufactured by the Ellwood Wiles Company, 532 S.E. Belmont Street, Portland 14, Oregon. The louver has been developed in four models which provide for a varying degree of cut-off from either side of the

center axis of the light panel, varying from 10 degrees—30 minutes to 26 degrees—30 minutes. There are two intermediate cut-offs between the above ranges—14 degrees and 18 degrees—30 minutes. The 14 degree cut-off is illustrated in Exhibit B.

The use of the louvers, as will be noted from the illustration, cuts the cross street vehicular signal off from observation. It also cuts the view of the vehicular signal off from the pedestrian, so he has one, and only one, indication for his use, that being the Wait-Walk signal. For the acute angle intersections where separate timing must be established for traffic entering the intersection from several streets, and it is necessary to set traffic signal heads in close proximity to each other, the louvers have been especially effective for they confine the visibility of the signal to a relatively narrow field, thus minimizing possibility of the motorist approaching the intersection perceiving the wrong signal indication. The corregated vertical fins of the louver afford just enough contrast against the background of a signal lense so that the vehicle operator can readily determine whether the signal is on, even though the sun's rays may be directly behind the signal head. This precludes false indications by sun rays. The louver was so designed that while it reduces any glow to a desirable minimum, the sight distance characteristics of the signal light beam within the angle of obscurity of the louver is in no way impaired. This affords a maximum visibility during hours of daylight as well as darkness and on dismal, rainy or foggy days.

These "Straitray" louvers became a standard for all Oregon traffic signal installations in 1946 under the guidance of F. B. Crandall (Member, ITE), Traffic Engineer, Oregon State Highway Department, and Fred T. Fowler. Though the observance was excellent when the vehicular signal indication was mounted overhead, and the pedestrian signal was mounted on a corner post in 1941, the results of the addition of the louvers was equally as effective, not only from the standpoint of observance, but from the standpoint of clearing the intersection, reducing accidents and developing a more orderly flow of vehicular and pedestrian traffic through signalized intersections.

Open Discussion

Double-face Traffic Sign

THE ITEM on "Double-face Traffic Sign" under the heading of *Reference Notes* in the May issue of "Traffic Engineering" magazine bears comment and possibly some clarification by Mr. Charles J. Walker.

We cannot tell from the photos if the intersection shown has another double-faced stop sign in the near right (normal) position for traffic coming the other way. It is our thought that if the stop regulation is warranted the driver should be given the normal near-right sign and not be forced to look for a far-left sign at some intersections. The cost of one accident as a result of an overlooked stop sign would wipe out the 50% saving in posts at several locations.

We have one location with a near-left stop sign made necessary by the nearness of a parallel railroad siding on the right hand. Our experience with persons overlooking the left-hand sign has made it necessary to use a pavement stencil STOP to supplement the sign.

If the back-of-sign legends are used only as supplements to normal right-hand signing the system has merit.

It has been our observation that the back of a stop sign is not "waste space". The distinctive shape of the sign informs drivers on the other approaches that that particular street is controlled by a stop sign.

James R. Wichman (Jun. Mem., ITE)
Traffic Engineer, Kalamazoo, Michigan

ANSWERING Mr. Wichman's inquiry in regard to "Double Face Traffic Signs". We use the orthodox 2 post arrangement for double-face stop signs, which means a near-right, far-left sign for both directions.

I have today noted a case where one post had been knocked down, yet its mate with a double-face sign was doing duty in both directions. I would not consider the use of only one post for stop intersections.

When the near-right sign is obscured by a truck the far-side has very definite value in alerting an approaching driver.

Many accidents spring from inadequacy of stop warnings, but the use of 4 posts and 4 single or 2 double face signs will do a better job. I much prefer the double-face 2 post plan.

In the use of double faces we secure a considerable economic saving in both the speed limit and stop signs. In the case of the speed limit signs only half the number of signs are required. This is important as the cry of too many signs is now heard throughout the land.

To further improve stop warnings we are placing opposite the sign post, in the middle of the lane and at right angles thereto, three plastic markers, which we feel will alert the sleepy driver, and should withstand winter snow removal activities.

Charles J. Walker
Traffic Engineer, Gary, Indiana

Truck Loading Facilities

THIS IS in further support of Mr. Charles A. Goodwin's proposal of 30 feet as the unit of length for a single truck loading zone.

Mr. George J. Fisher, in the March issue, proposed that truck loading zones should be made in terms of a parking meter space or a parking space rather than an odd length of 30 feet.

The use of 30 feet as the length for a single zone is particularly applicable to parking meter areas or non-metered areas which have been marked for parallel parking. The reason is this: We use in Oakland 22 feet as the basic parallel parking stall for a passenger car. However, exterior

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REFLECTOR RING . . . Half-hard aluminum 1/16-inch thick, formed to provide a flat, rigid surface against which the twin-ring dust seal is compressed. It is so shaped that the reflector gasket is held firmly in place.

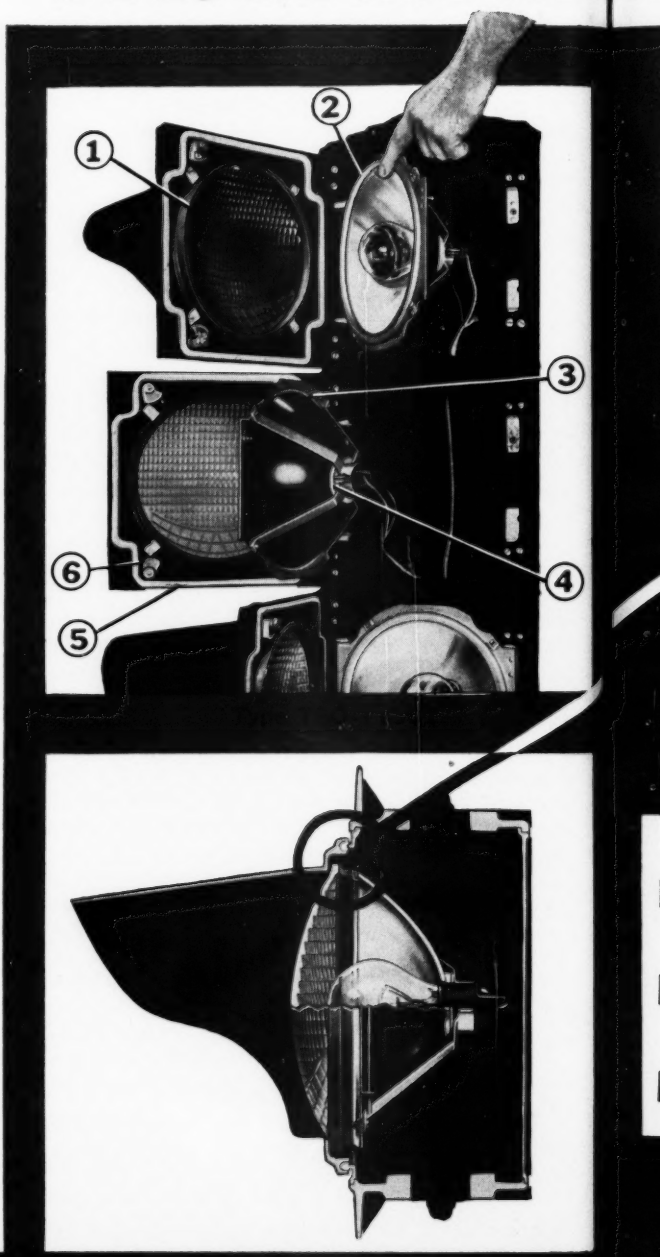
REFLECTOR GASKET . . . Cork, punched from a solid sheet . . . not spliced at any place. It fits tightly in the back of the reflector ring and will not fall out. This gasket provides a perfect seal against the ground edge of the reflector.

RECEPTACLE GASKET . . . Cork, punched from a solid sheet . . . not spliced at any place. It fits tightly around the smooth surface of the molded composition lamp receptacle, and is held firmly against the apex of the reflector by a metal washer.

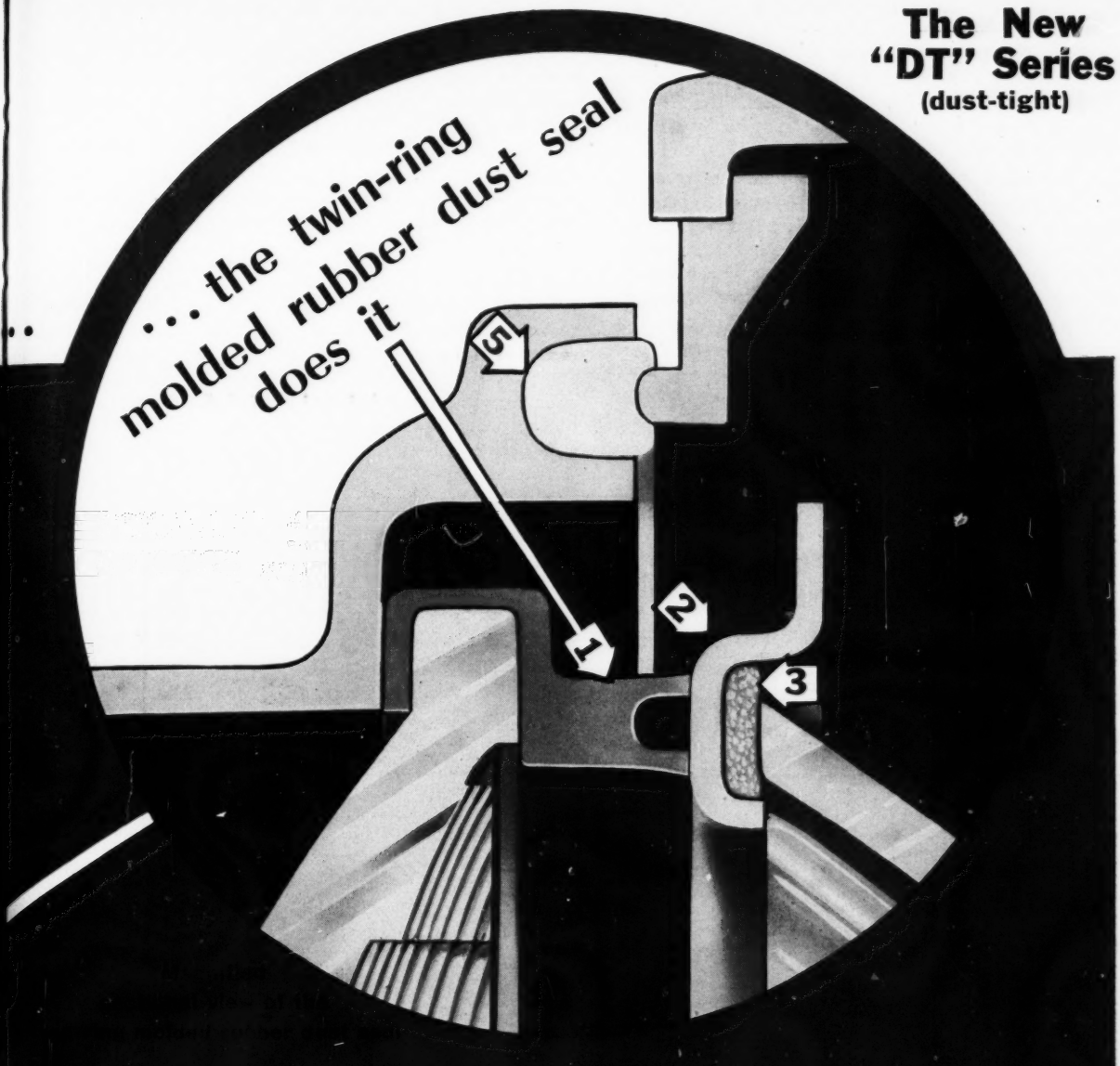
RESILIENT DOOR GASKET . . . Cemented into the gasket groove of the door, and is closed against a raised bead on the signal housing. This gasket will not become hard or brittle, and retains its resiliency indefinitely.

TWO DOOR CATCHES . . . Two cam-acting lever catches which, when turned approximately 90 degrees, fasten the door securely, thus excluding all dirt, dust, and moisture. The cam-acting catches bear against the inner surface of the signal housing and lock the door tightly against the gasket.

The Dust-Tight Traffic Signal is built to Crouse-Hinds high standard of quality . . . from the finest materials, with painstaking care, by skilled craftsmen. Write for additional information on this outstanding development in the traffic engineering field.



The New "DT" Series
(dust-tight)



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3. **CORK REFLECTOR GASKET** . . . . gives a dust-tight joint at the reflector edge.
4. **CORK RECEPTACLE GASKET** . . . . completely seals the receptacle opening.
5. **RESILIENT DOOR GASKET** . . . . makes the housing weather-proof.
6. **DOOR CATCHES** . . . . two on every door insure uniform pressure against the door gasket and the twin-ring seal.

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stalls, which are stalls immediately next to no parking zones, crosswalks or truck loading zones, are but 18 feet in length since exterior stalls are much more easily maneuvered into. Interior stalls are a minimum of 20 feet and a maximum of 22 feet depending on the space available. The 22 foot stall has given us the least trouble and apparently is sufficient for all the new large models of cars.

To be flexible, truck loading zones should be made of such a length that they can be taken out or placed in between a group of regular parallel parking stalls without disturbing the 22 foot requirement for interior stalls. Loading zones are, therefore, granted in lengths of 30 feet with multiples of 22 feet added in accordance with the total length of loading zone needed. In other words, 30 ft., 52 ft., 74 ft., etc. A parking arrangement having a 30 foot loading zone in the center of a block with two 18 foot stalls on either side becomes three 22 foot parking stalls upon cancellation of the loading zone. Similarly a 52 foot loading zone with 18 foot parking stalls on either end would become four 22 foot parking stalls upon cancellation of the loading zone.

This arrangement operates satisfactorily since we have a rather intensive enforcement of the use of truck loading zones and a consequently good turnover, especially in the central business district. It follows, therefore, that practically speaking, a parking stall adjacent to a loading zone has the advantage of an empty loading zone for use of the motorist in maneuvering into the shorter length exterior stall.

Erling Horn
Assistant Engineer Traffic Engineering Division
Oakland, California

Policy on Drive-in Theaters

The "Policy on Drive-In Theaters," just released by the American Association of State Highway Officials, is an authoritative and helpful guide to all persons associated with these modern roadside enterprises. The new publication is based on a survey and analysis of conditions at approximately 300 theaters in 37 States, and contains approved standards for theater planning, design and operation including the all-important provisions for storage off-the-highway.

The policy is liberally illustrated with numerous actual and recommended theater layouts. The legal and administrative aspects of this relatively new roadside use are also treated at some length. Detailed data are appended for the many theaters studied on such items as location, date built, highway design, theater access facilities and control, traffic volume, speed, accident experience, police or other traffic control measures, theater capacity, time to fill and time to empty.

Planning and traffic authorities will find this a useful and down-to-earth publication, written from the accumulated experience and knowledge of practicing engineers who have made a special analysis of the factors involved in this popular roadside attraction. Prepared by the Subcommittee on Roadside Control of the AASHO's Committee on Traffic, this 110-page policy is now available from the Association offices, 917 National Press Building, Washington, D. C. Price $1.50.

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TRAFFIC NEWS

Clinic Tackles Traffic

By William E. Billings (Assoc. Mem., ITE)
Director, Transportation and Safety, Cleveland Automobile Club

Convinced that "know-how" is the essential ingredient in relieving traffic congestion and reducing accidents, the Cleveland Automobile Club decided upon a traffic seminar for communities in the Greater Cleveland area, this approach promising most in smoothing traffic flow. Encouraged by a favorable response to the proposal and assured of cooperation from Mr. Harry E. Neal (Mem., ITE), Chief Engineer of the Division of Traffic and Safety of the Ohio Department of Highways and Mr. Vurnen Johnson (Mem., ITE), traffic engineer in charge of Cleveland's Traffic Division, the Automobile Club was well on the way to its first traffic clinic.

Chief administrators of the approximately one hundred municipalities of Cuyahoga, Geauga, Lake, Lorain and Portage Counties received invitations to the meeting. Communities were asked to indicate traffic subjects pertinent to local problems for inclusion in the agenda. The one day meeting got off to a good start with thirty-four participants. Mayors, city engineers, chiefs of police and a safety council president responded to the opening roll call.

Mr. Harold G. Eckhardt (Mem., ITE), Assistant Chief Engineer of the State Division of Traffic, kicked off the meeting on the subject of parking, a happy choice since it registered top interest with the group. Economic considerations of the parking juggernaut, prohibited parking particularly during traffic peaks, advantages of parallel over angle parking, relief provided by skip stops of mass transportation vehicles, development of off-street parking facilities under new Ohio statutes to bring parking capacity into balance with demand, procedure for selecting the most effective curb parking limits and advantages of parking meters stimulated lively discussion that went far toward a clarification of this perplexing problem, common to almost every American city today.

Mr. Thomas J. Lisly, Electrical Engineer for Cleveland's Traffic Division, delivered a most enlightening address upon warrants for traffic signals, their installation and proper timing to serve the traffic needs of the intersection. To accommodate a heavy left turn movement without the expense of an additional signal face with left turn arrow, a delayed green for approaching traffic to permit left turning traffic to proceed without interference was offered as a solution to the problem. Discussion led to the controversial subject of the relative advantages of corner vs. center overhead suspended traffic signal installations. Supporters of the corner location pointed out that the overhead type requires the driver to take his eyes off the road to look up, which is particularly hazardous when the glare of the sun behind the signal face makes it difficult to distinguish colors. On the other hand corner signals are sometimes concealed by trucks or go unnoticed because of neon lights of advertising signs in the background. While no agreement was reached as to preferred location, participants were unanimous in encouraging uniformity in order that drivers may know where to look for traffic signals. Preference was expressed for yellow traffic signal frames over green because of better visibility especially with a background of foliage.

Under the able direction of Mr. Russell Deetz (Mem., ITE), Traffic Engineer of the State Highway Department, the group turned its attention to one-way streets. Among the phases discussed were the essential requirements of one-way operation. Also, the value of unbalanced flow to favor traffic peaks

Group picture above was taken during the traffic seminar. At the speakers' table, standing, left to right, are: Karl Jagenberg, Cleveland Police Dept.; Harry B. Hannah, Asst. Traffic Engineer, City of Cleveland; William L. Hammond, Asst. Dir. of Transp., Cleveland Automobile Club; William E. Billings, Dir. of Transportation and Safety, Cleveland Automobile Club; Harold G. Eckhardt, Asst. Chief Engr., Div. of Traffic and Safety, Ohio Dept. of Highways; Russell Deetz, Traffic Engineer, Div. of Traffic and Safety, Ohio Dept. of Highways; James H. Ferrie, Asst. Dir. of Safety; Cleveland Automobile Club; Vurnen L. Johnson, Chief Traffic Engineer, City of Cleveland; and Thomas J. Lisly, Electrical Engineer, Cleveland Traffic Engineering Division.

was considered with effective controls similar to the traffic signal system recently installed by the Virginia Department of Highways on a three lane highway in Arlington County.

In his review of traffic engineering techniques for pedestrian protection, Cleveland's Traffic Engineer Vurnen Johnson enlightened the conference upon pedestrian signals, center islands, curb barriers, overpasses and tunnels, crosswalk marking, prohibited turns, and restricted curb parking near crosswalks for improved visibility.

General reaction indicated the traffic conference to have been a success. One city engineer wrote, "It was one clinic, conference, or plain get together where down-to-earth, every day problems were discussed by the men who must solve the problems locally. I am sure everyone of us received benefits that will pay dividends to our respective communities far beyond our expectations."

The conference proved the great need for traffic information by administrators charged with the responsibility for moving traffic efficiently. In order to be of all possible service the Cleveland Automobile Club planned two traffic seminars for 1950: One encouraged the revision of municipal traffic codes in conformity with the State statutes and the second will offer a traffic clinic to which communities in the area may submit their individual traffic problems for analysis and solution.

Charlotte Authorizes Bus Survey

The City Council of Charlotte, N. C., recently authorized the City Traffic Engineer, Herman J. Hoose (Assoc. Member, ITE), to conduct a two-month survey of the Duke Power Co.'s Charlotte bus transportation system with a view toward improving the service. Mr. Hoose recently outlined the scope of the survey at a scheduled appearance before the City Council.

He stated that the purpose of the survey will be to collect factual data on:

1. Routes to best serve Charlotte, which will include expansion of system.
2. Schedules, which will include running times between route points, maintenance of schedule and reasonable variations, and headway (time between service).
3. Stops, their location and size.
4. Transfer points, city-wide by location and relation to other lines.

Dallas T-Man System Gets Salute in Pageant Magazine

Dallas T-Men are responsible for making Dallas the fourth safest city in the country, the safest in Texas and the most traffic-conscious city in the world. That's how Pageant Magazine pays tribute to the Dallas Traffic Safety Program in an article in the current August issue entitled, "In Dallas Everyone's A Traffic Cop."

In 1937, before the T-Man, there were more than 111 traffic fatalities for every 10,000 cars registered in the city of Dallas. Today, says Pageant, there are less than five deaths to the same number of registrations. And because of the decrease in traffic accidents of all kinds, Dallas residents now enjoy lower automobile insurance rates than any other city of comparable size in the entire United States.

The Pageant article gives an example of how the T-Man system works: "Although the traffic light had already changed to amber, the driver of the sleek black convertible did not bring his car to a stop. Instead, he crossed on the red light and proceeded on his way.

"Several days later the driver—a prominent Dallas businessman — received a courteous letter saying that a car bearing his license number had been reported by a Dallas T-Man as running a red light at the corner of Lamar and Elm Streets on November 11, 1949, at approximately 5 p.m. The letter, signed by Dallas Chief of Police, C. F. Hansson, concluded with a request for the owner's cooperation in observing safe driving rules.

"The businessman read the letter through, flushed, laughed a little self-consciously—but he did not get angry. He did, instead, what was typical of many of the 16,000 persons who received similar letters last year. He sat down and wrote a letter to Chief Hansson thanking him for the letter and pledging his support to the T-Man program."

Records show that there are very few repeaters. After receiving one T-Man letter according to Pageant, a motorist rarely receives another. No punches are pulled or exceptions made when it comes to mailing out T-Man letters. Although the Chief of Police has never received a letter, the wife of a former mayor did. R. W. Thompson, present chairman of the T-Man Committee, was also once tripped up on a violation.

T-Men have been organized in two other Texas cities, Fort Worth and Tyler. Wherever it is tried there never seems to be any dearth of T-Man recruits. Apparently, says Pageant, there breathe few men—motorist or pedestrian—with soul so dead that they have not had the urge to report traffic violation they have witnessed.

Consultants Are Necessary

Every so often one hears that the profession of consulting engineers is on its last legs. Even consultants themselves have been known to voice such beliefs after seeing some important commission taken over by the staff of some public agency. Such despondency, however, is not justified, and both the record and a demonstrable need for the services of consulting engineers can be cited to prove it.

It is true that the nature of consulting services has changed in some particulars over the years. Principally this may be noted in the fact that there are fewer straight designing jobs today than formerly. The bulk of the road and dam designing, for example, is now done by governmental agencies. But it is also true that the need for and the use of consultants as specialists has in no wise diminished. Indeed new fields have opened up, such as that of soil mechanics, and a re-entry of the consultant into the highway field has accompanied the new interest in toll roads. The great New Jersey turnpike is almost wholly a consulting engineer operation.

New York City last week afforded a prime example of the reliance that modern engineering practice places on the consultant and of the essential service that he can perform. New York's various engineering departments are big and competent enough, if any in the world are, to plan and design engineering work. But New York, historically, has relied upon consultants for guidance on important engineering decisions. The reason is clear, and points up the basic justification of the consultant. City departments, and governmental agencies, cannot afford to keep specialists on their staffs for only occasional use. Even if they could, the specialists are not in a position to keep up with advances in their specialties. Even if they were, their judgment would benefit from an unbiased outside opinion.

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reaching decisions regarding water supply, New York went to private consulting specialists for advice. Befitting the magnitude of the problem they hired not only one but five top-ranking specialists to confer and study various alternatives jointly. New York is thus assured of unbaised, authoritative advice based on years of experience with every conceivable type of water supply problem in this country and elsewhere. In no other way than through the services of expert consultants could this assurance be had.

The day of the consulting engineer is not over. It is not even threatened. Keen specialists, kept keen by constant activity in their specialities, are a bulwark against decadent technology and mistaken economics in civil engineering. No doubts on this score should be entertained—in engineering schools, in engineering departments of government or business and, least of all, in the minds of the consultants themselves.

(Editorial from the Engineering—News-Record—June 1, 1950)

Mississippi River Parkway

The Mississippi River Parkway project is being revived.

A parkway skirting the river from Lake Itasca to New Orleans was first proposed at the St. Paul-Minnesota Planning Conference in 1938.

$150,000 has been appropriated by Congress out of a total authorization of $250,000 for the National Park Service Dept. of the Interior, and the Bureau of Public Roads, Dept. of Commerce, to make a joint survey which will analyze the needs for a parkway along the Mississippi River Valley that will serve the people for personal enjoyment and accentuate its national beauty spots.

There will also be co-operation with the War Department, Corps of Engineers, Fish and Wild Life Service, and the Forestry Department.

The survey is to be completed by August 24, 1951, a true parkway prohibiting commercial traffic, billboards, hot dog stands, etc.

Ten states are involved and the commission for Minnesota as appointed by Governor Youngdahl are: Lew E. Fiero, Director, Div. of State Parks; S. A. Freelsen, Director, Div. of Water Resources; M. J. Hoffman, Commissioner, Dept. of Highways; O. L. Kipp, Chief Highway Engineer, Dept. of Highways; James W. Clark, Commissioner, Dept. of Business Research and Development; all of St. Paul; Ed Shave, Outdoor Editor, Minneapolis Star & Tribune; Lorenz G. Straub, Head, Dept. of Civil Engineers, University of Minnesota; George Heller, Vice-Pres. and Secy-Treas., Johnson, Drake & Piper, Inc., all of Minneapolis; Hon. Leonard R. Dickinson, Representative, 62nd District, of Bemidji; Carl Zappfe, Land Commissioner, Northern Pacific Railroad, of Brainerd.

Some of the finest scenery on the river adjoins St. Paul. Here is found one of Nature's catalysms of the preglacial period. The St. Croix River originally came down Phalen Creek and into the Mississippi River under Daytons Bluff and the Mississippi River flowed down Trout Brook Valley. The St. Croix probably became blocked by glacial debris north of Lindstrom, and swung eastward to its present channel leaving a chain of lakes to mark its ancient route, now used as the St. Paul water system and also Pigs Lake. This pre-glacial Mississippi channel also became blocked by drift leaving Long Lake, Lake Johanna, Lake Josephine, and McCarron's Lake to mark its old river bed.

The big bend in the river from Fort Snelling through St. Paul to Newport was undoubtedly made by the glacial River Warren.

The high point of this panorama, 980 feet above sea level, is a hogback paralleling the boundary between South St. Faul and West St. Paul south of Annapolis Street. Here one may view the entire area of these great geological changes.

A meeting will be held by the Parkway Planning Commission in February at St. Louis, in May at Jackson, Mississippi, and in August at Douglas Lodge, Lake Isaca.

The above photograph was taken at a special ITE award ceremony held in Cleveland in June. Harry Neal, Vice President of the Institute, is shown presenting a duplicate first-place award plaque to Vurnen Johnson, Traffic Engineer of Cleveland, for outstanding performance in traffic engineering for the year 1949.

On June 27, 1950, the Michigan Good Roads Federation held a special award dinner honoring Charles M. Ziegler, State Highway Commissioner of Michigan. In the photograph above, Comm. Ziegler, center, is shown receiving the ITE award for outstanding performance in traffic engineering during 1949, from Robert S. Holmes, Executive Secretary of the Institute, left; and a special resolution of congratulations for a record of outstanding achievement in traffic engineering from Jay F. Gibbs, President of Michigan Good Roads Federation, right.

LOOKING AHEAD

AUGUST 21-24, 1950—PASADENA, CALIFORNIA
National Technical Conference. Illuminating Engineering Society. Hotel Huntington.

SEPTEMBER 11-14, 1950—PORTLAND, OREGON
American Association of Motor Vehicle Administrators. Multnomah Hotel.

SEPTEMBER 18-21, 1950—NEW YORK, N. Y.
55th Annual Convention. International Municipal Signal Association, Inc. Hotel Commodore.

SEPTEMBER 24-27, 1950—NEW YORK, N. Y.
Annual Meeting. Institute of Traffic Engineers. Hotel Commodore.

SEPTEMBER 25-27, 1950—LOS ANGELES, CALIFORNIA
American Transit Association. Biltmore Hotel.

OCTOBER 7-12, 1950—COLORADO SPRINGS, COLORADO
57th Annual Conference, International Association of Chiefs of Police. Antlers Hotel.

OCTOBER 9, 10 & 11, 1950—CHICAGO, ILLINOIS
Annual Meeting. National Council of State Boards of Engineering Examiners. Congress Hotel.

OCTOBER 15-18, 1950—NEW YORK, N. Y.
American Public Works Association. Hotel New Yorker.

OCTOBER 16-20, 1950—CHICAGO, ILLINOIS
38th Annual Safety Congress & Exposition, National Safety Council, Stevens Hotel.

COLUMBUS SELECTS Grote STREET NAME SIGNS FOR Progress AND Safety

Prominent in the center of the nation's educational, industrial and agricultural economy, Columbus, Ohio proclaims its leading position among cities by marking every street with GROTE Street Name Signs. Selected because they are easy to see and to read in split seconds, these attractive GROTE Street Name Plates are fit complements for the residential boulevards and the business streets of progressive cities. Built for years of dependable long-wear service, they will not crack, chip or craze — or admit water to rust the highly embossed letters. These better signs will always remain bright and attractive to guide traffic safely, to reflect the pride of the community and to sustain the confidence of citizens in the accomplishments of their administration. There is a design of GROTE Street Name Sign most suitable for your city — where the need is for signs that resist corrosion or climatic action — whether you need an immediate overall sign installation or a sign program extending over a period of years. Write for information on these Modern Signs for Modern Communities.

Representation in all major marketing centers.

Grote MANUFACTURING CO., INC.

BELLEVUE, KY.

Established 1901 — *Opposite Cincinnati*

convertible

universal

automatic

new

PARK-O-METER

for on-street parking regulation

PARK-N-LOT*

for self-liquidating off-street facilities

ask for our new literature describing the meters that bring you every operating advantage and every maintenance economy suggested by leading engineers and municipal officials from every section of the United States.

• IF YOUR CITY HAS NO PARKING METERS

• IF YOURS IS AN Obsolete INSTALLATION

• IF YOU HAVE UNSOLVED PARKING PROBLEMS

YOU ASSUME NO OBLIGATION . . .
MAIL YOUR REQUEST TODAY

*T.M. Reg. U.S. Pat. Off.

Magee-Hale PARK-O-METER COMPANY

COMMERCE EXCHANGE BUILDING, OKLAHOMA CITY 1, OKLA.

"We're lighting 333.7 MILES OF MAIN ARTERIES to make a safer Seattle"

says **J. W. Arch Bollong,**
Traffic Engineer
Seattle, Washington

"OUR city is now embarking on a program of lighting 333.7 miles of streets—all lighting of the mercury vapor type. During 1949 we spent over $500,000 and this year we'll spend over $1,500,000. When this improvement is completed, we feel Seattle will be a safer town in which to live, work and play."

FOR MORE FACTS... *Write for your free copy of "Planned Progress in Street Lighting".*

The Street and Traffic Safety Lighting Bureau, 155 East 44th St., New York 17, N. Y.

Sign Here

FOR INTELLIGENT TRAFFIC DIRECTION

Intelligent traffic direction calls for correctly placed, attractive, easy-to-read street markers and signs. And, pardon the pun, **THAT'S WHERE WE SHINE.** Just sign the enclosed coupon, send it to us for complete information.

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for Complete Sign Information

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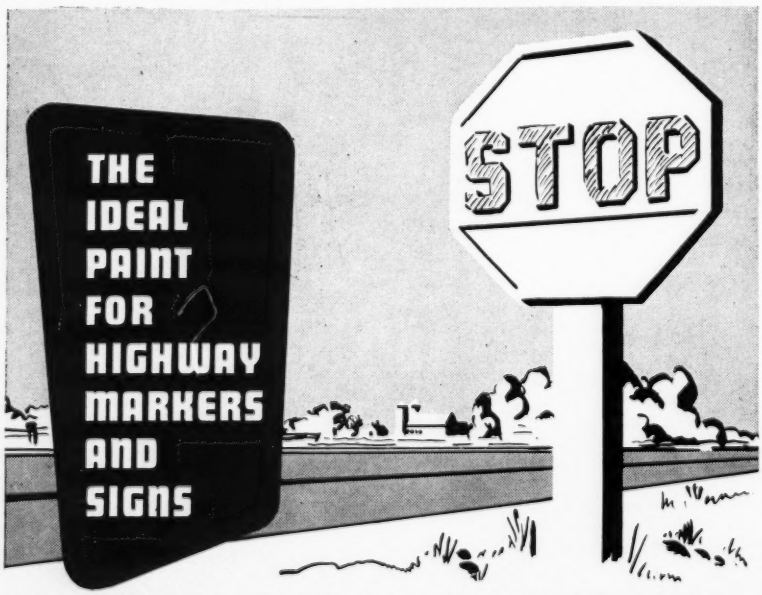
Address_____

City_____ State_____ 8-50

MANUFACTURED BY

MIRO-FLEX CO., INC.

1824 EAST SECOND STREET—WICHITA, KANSAS



BETTER VISIBILITY

These brighter colors make your message stand out. Fine gloss finish further increases visibility.

LONG LIFE

Dries with a hard, tough surface that lasts indefinitely in all climates.

LOW COST

Covers 900 to 1200 sq. ft. Works faster, goes further.

NAZ-DAR WEATHERPROOF SILK SCREEN ENAMEL

Make Naz-Dar your headquarters for ALL silk screen supplies. Color, silk, squeegees, stencil knives, everything you need for bright, long-lasting signs. *Write for further information.*

TE 8-50

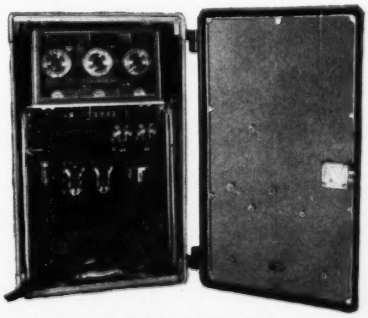
Naz-Dar Company

469 Milwaukee Ave.
Chicago 10, Illinois

The Controller that grows with traffic!

You can convert a one-dial controller to two dials by just plugging in the second dial unit and its latch relay.

Each dial unit has its own synchronous motor, timing gear, dial contacts and timing keys.



Unitized construction is the key note of this new design controller—thus major parts can be readily replaced for servicing in a matter of minutes.

This is General Electric's new expansible controller. Buy it as a one-dial unit. Use it with or without interconnection. As traffic volume builds up or as conditions change just plug in a second dial unit—or a third. That's how easy it is to keep your traffic-control system growing with traffic!

This new traffic controller is a finer piece of equipment mechanically and electrically—as well as completely new in design. It greatly simplifies your planning and buying; it increases reliability and cuts maintenance. Let your nearest G-E Apparatus Sales Office or traffic control distributor show you how. Apparatus Department, General Electric Company, Schenectady 5, N. Y.

GENERAL ELECTRIC

Traffic Light Pressure

Robert A. Mitchell (Mem., ITE), of Philadlephia, was up-held in a recent incident involving pressure tactics relative to the installation of traffic signals. A recent neighborhood demonstration, wherein citizens stopped traffic in order to prove their point, was broken up by the police on charges of disorderly conduct and inciting to riot.

Mitchell stated traffic signals should be installed only where careful study indicated they would be beneficial. Demonstrations stopping traffic, he pointed out, are not the proper way to attain the desired end even though neighborhood opinion in favor of a signal may be right.

The *Philadelphia Inquirer* in an editorial following the incident up-held Mitchell's contention that all traffic signal installations will be on the basis of need as determined by engineers. The *Inquirer* further pointed out that if they were on any other basis, such as that of individual neighborhood pressure, the results would be unsatisfactory and even dangerous.

Albuquerque Officials Speed Action on Traffic Survey Recommendation

Prompt action on recommendations of the all-inclusive highway transportation survey recently completed in Albuquerque, N. M., has been taken by the City Commissioner and New Mexico State Highway Department. The City has authorized the hiring of a traffic engineer and establishment of a traffic board, and has taken the required initial step in adoption of the Model Traffic Ordinance. A public hearing has been held on adoption of the proposed arterial street system as the Major Street Plan of the City. The State Highway Department has begun surveys on the proposed arterial streets.

The survey, financed jointly by the State Highway Department, the City and the U. S. Bureau of Public Roads, was given direction by Automotive Safety Foundation staff. D. Grant Mickle (Mem., ITE), director of the survey and head of the Foundation's Traffic Engineering Division, formally presented the survey report to the public officials May 22, and to the public at a separate meeting of 400 people, just one year after the integrated survey was started. He was assisted in the presentations by staff traffic engineer Gordon Gravelle (Mem., ITE), who was resident engineer of the project.

Survey Considered All Traffic Problems

Covering all major phases of the traffic problem, the report emphasized basic low-cost steps which the City could promptly take. Consideration was given to the fact that Albuquerque, which tripled its population in the last 10 years, grew too fast to have obtained facilities which a city of 100,000 normally would possess. It was found, for example, that two-thirds of the streets are unpaved.

Highlights of Recommendations

The many recommendations were inter-related in all possible ways to enable the City to make the greatest progress at the lowest practical cost. In addition to those indicated above, some of the recommendations are:

Adoption of a one-way street system, of a progressive traffic signal system, and of other modern techniques to greatly increase capacities of present facilities

Adoption of a zoning ordinance to protect present and future street rights of way

Establishment of a public safety organization to carry on the public aspects of the Action Program of the President's Highway Safety Conference

Adoption of the recommended arterial street system as the Major Street Plan

Development of that system on a planned basis as a financial program is determined and as funds become available

Adjustment of City administrative machinery so that better cooperation and financial programming may be obtained in work involving the State Highway Department and the Bureau of Public Roads

Construction of open-deck parking structures in the vicinity of downtown businesses where parking space is far from adequate, and formation of a study committee to determine a financial program

Re-routing of buses, and lengthening of bus stops to reduce interference with general traffic

Elimination of unnecessary truck loading zones at curbs, and official designation and improvement of certain arterials as truck routes

Propose Three-Phase Program

The survey report grouped necessary physical improvements into three phases, with the first phase containing projects needed to meet present and impending deficiencies in street capacity which could not be met by application of traffic engineering. Most improvement projects are street widening and paving and new connections to relieve the presently over-burdened and limited number of through streets. The State Highway Department is making surveys to determine rights of way for a new bridge across the Rio Grande and connections, and is drawing plans for widening of the two present narrow bridges in accordance with survey recommendations.

Printing of the report, being handled by the State Highway Department, was completed in July.

Discusses Street Capacities

Since the Albuquerque highway transportation survey was one of the first to utilize the manual on street capacity, recently developed under Highway Research Board auspices, Mr. Gravelle was asked to explain its practical use at four West Coast meetings held early in June. He appeared before three California conferences, in San Francisco, Los Angeles and San Diego, held by the Institute of Transportation and Traffic Engineering of the University of California, and before the Third Northwestern Traffic Engineering Conference at Corvallis, Oregon.

IMSA Traffic Signal Session Re-scheduled

In the May 1950 issue of "Traffic Engineering" magazine, page 321, it was reported that a special traffic signal session would be held on Thursday, September 21st as part of Traffic Signal Day, during the IMSA convention. We have just learned from the IMSA Secretary that this session has been re-scheduled to Tuesday, September 19th. The Chairman designated for Traffic Signal Day will be Jacob S. Katz, Chief Engineer, Police Department, New York City.

A cordial invitation is extended to all members of ITE to attend and participate in this convention.

MEMBERSHIP INFORMATION
may be obtained by writing to:
Executive Secretary
Institute of Traffic Engineers
Strathcona Hall
New Haven 11, Connecticut

RE-VALUATE YOUR SCHOOL AND TRAFFIC SIGN PROTECTION

It's good business to take a new, fresh look at your sign system . . . to check its value and determine its effectiveness.

Dull signs should be repainted for there is nothing so ineffective as a weary warning . . . nothing so impelling as a crisp, bright sign. Worn-out signs need replacements.

Traffic conditions often change so that complete new signing is indicated. This is appraisal time . . . a good time to check your protection . . . to order the signs you need . . . both for immediate erection and essential stocking.

Lyle has resident representatives in nearly every state. Write today for information, prices and delivery dates. If you do not have a copy of Lyle Sales Manual—B-48, we'll be glad to send you one.

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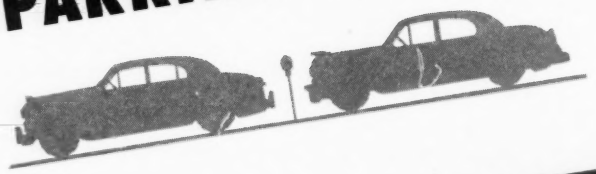
Presenting the new KARPARK TWIN-O-MATIC PARKING METER



Brilliantly designed . . . starring every feature wanted in a parking meter . . . The KARPARK Twin-O-Matic scores a BIG HIT with everyone . . . mayors, treasurers, safety directors, police officers, and the parking public.

THE STURDY KARPARK "HUSKY"

THE STEEL HEAD KARPARK "SUPERIOR"

JOINING THE "FIRST FAMILY" OF PARKING METERS
The Twin-O-Matic is a new addition to the famous KARPARK line. With its "extra" features it rounds out and completes the greatest selection of meters available—every model noted for accuracy, sturdiness, and trouble-free performance.

Here's a brief listing of
IMPORTANT POINTS:

TWO METERS IN ONE HOUSING: Each Twin-O-Matic times two cars and cuts in half the number of installations needed. Initial cost is reduced to the minimum; servicing and collection are speeded with maintenance expenses kept low; neat appearing streets are assured.

INTERCHANGEABLE METERS: Each complete, independently operating mechanism can be readily shifted from twin to single; from one housing to another. Extreme flexibility in use makes it easy to take care of any desired change in parking practice.

EASY TIME OR COIN CONVERSION: Changes in parking control and regulations are instantly made . . . on the street or parking lot . . . in a matter of minutes. Easy adjustment to any parking condition increases scope and multiplies use of meters.

. . . and companion meter

THE KARPARK UNIMATIC

for single car parking

CHOICE OF FULLY ACCUMULATIVE OR NON-ACCUMULATIVE TIME: Makes it possible to meet any parking requirement, in any locality. This "extra" adaptability permits greater freedom, greater efficiency, more specific application in traffic planning.

AUTOMATIC OPERATION: The easy, simple insertion of a coin is all that's required of the parker. Trouble-free enforcement, greater use, greater efficiency, and improved traffic control are automatic results.

MADE BY THE HERSCHEDE HALL CLOCK COMPANY: Parking meters are timing devices. Quality of workmanship and assurance of dependable performance are guaranteed by the outstanding reputation of Herschede —makers of the finest clocks in America for over three generations.

COMPACT, MODERN DESIGN: Carefully planned to utilize every inch of space, the modern, stream-lined appearance of this KARPARK triumph reflects a progressive, well managed city. The single meter—used at street ends and special single locations—blends in design with the Twin-O-Matic meter and maintains, everywhere, a uniform attractive effect.

LOW IN COST: Though the line-up of its features is imposing, the price of this new meter is surprisingly low. Every responsible city official will want to investigate the economies offered.

WRITE FOR FULL INFORMATION: To know more about the details and the many commanding advantages of this new KARPARK creation, write today.

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Secretary's Column

The Board of Direction held the longest meeting in its history in a two-day session at Balsam Lake, Wisconsin, June 23-24, 1950. The Board held its meeting at Balsam Lake by special invitation of the "F&F" club, predecessor to the Midest Section, ITE.

Members of the Board present to enjoy the hospitality of the club and participate in the deliberation included: President Smith, Vice President Cherniack, Secretary-Treasurer Osborne and Directors Darrell, Porter and Prisk. Your Executive Secretary was on hand as usual to record the minutes of the meeting. The total elapsed time of the Board session was twelve hours, due to the many important items on the agenda.

Pending final action by membership vote following the Annual Business Meeting, relative to a change in the fiscal year to conform with the calendar year, the Board approved an interim operating budget for October, November and December 1950. The Board also gave financial approval to a commercial audit of Institute books of account at the end of the current fiscal year, or at the end of the calendar year, covering fifteen months' operation, subject to the recommendations of the Institute's accounting consultant.

The Executive Secretary reported that ITE Technical Bulletin No. 3, dealing with traffic actuated signal controllers, had been submitted to the American Standards Association in accordance with previous Board action, for adoption and publication as an American standard. The Secretary also reported that the revised edition of "Traffic Engineering Handbook" would be off the press prior to the time of the Annual Meeting in September.

Mr. Cherniack, General Chairman of ITE Technical Committees, submitted a detailed report on progress of respective committees to date. Mr. Cherniack indicated that he was experimenting with an unofficial Technical Board consisting of himself, the chairmen of the six technical committees, the Executive Secretary of the Institute, and the Research Coordinator, Light B. Yost, as Secretary of the Board. He planned to call a meeting of this unofficial group at the time of the Annual Meeting to discuss the inauguration of a technical reference notebook for distribution in loose-leaf form to the membership and selected engineers and traffic officials.

Several proposed amendments to the Constitution and By-Laws were approved, by special resolution, for submittal to the membership. These changes deal mostly with new requirements for the Affiliate grade and a special recommendation to increase the maximum number of honorary members. The Board acted on the recommendations of a special committee and elected certain Affiliate members to Associate and full Member grades. This special election will be reported in another issue of "Traffic Engineering" magazine.

The Board considered several matters relative to the fiscal affairs of the Institute including a new permanent headquarters' location, a special travel fund for Board Members, and a revolving fund to assist local groups in the conduct of Annual Meetings. All of these matters were contingent upon approval, by the new Board of Directors, of the 1951 budget.

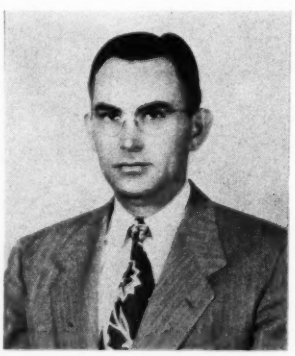
Fourteen new members and seven transfers were approved at this meeting, increasing the total membership of the Institute to 530.

Robert S. Holmes

New Appointments

MASON A. BUTCHER was recently appointed as the first Traffic Engineer of Montgomery County, Maryland, by County Manager, Irving G. McNayr.

He was graduated from the University of Nebraska in 1936 with a B. Sc. in Civil Engineering and from the Yale Bureau of Highway Traffic in 1940.



From 1936 to 1949 he was associated with the Nebraska Department of Roads and Irrigation as rodman, instrumentman, assistant traffic engineer, and State Airport Engineer. During the war, he served as an airborne electronics officer aboard an aircraft carrier. In 1949 he came to Washington, D. C. as Traffic Engineer for Capital Transit Company.

George T. Papageorge (Mem., ITE), is Director of the Montgomery County Department of Public Works, which is made up of five divisions: Engineering, Construction and Maintenance, Traffic Engineering, County Buildings and Tree Division.

The functions of the Traffic Engineering Division are to include: study and planning of traffic problems throughout the County; recommendations for the elimination of hazards for action by construction and maintenance division; recommendations for the erection of traffic signs and signals; recommendations for required street lighting as it affects traffic movements; and cooperation with the Division of Police Protection to effect better traffic control and enforcement.

SECTION NEWS

Western Section

A Portland-Salem Area meeting of the Western Section was held May 12th in Salem, with a tour of the Traffic Engineering Division of the State Highway Department, both Planning Survey and Traffic Control sections. A tour and inspection of the Sign Shop was also made. At the conclusion of the tour the group adjourned to the Copper Room of the Senator Hotel for a moment of thought and an hour of food.

At the recent Third Annual Northwest Traffic Engineering Conference held in Corvallis, June 1 and 2, the following Westernite members participated in the program or were in attendance: DON BERRY, JOHN CHAFFEE, F. B. CRANDALL, W. E. DEYOUNG, BOB DUNN, FRED FOWLER, GORDON GRAVELLE, J. AL. HEAD, VAL JOHNSON, RALPH KERSLAKE, CARLTON ROBINSON and LYNN STEWART, W. H. CARSTEN and W. J. WELLER.

There were some 80 registrations. The Conference was quite successful and will be continued on an alternating basis between the University of Washington and Oregon State College.

J. Al. Head
Secretary-Treasurer

H. N. Carver, President of Miro-Flex Co., of Wichita, Kansas, announced recently that Miro-Flex had acquired the business and assets of the Interstate Manufacturing Corp., free and clear of all incumbrances.

The Interstate Manufacturing Corp., which is located at 2655 West Van Buren, Chicago, Illinois, has been manufacturing a complete line of mirrors for trucks and buses, together with a line of clearance and marker lights.

Mr. R. D. Macfee, formerly President of the Interstate Manufacturing Corp., has been retained as Assistant to Mr. C. A. Clarke, Vice-President and General Sales Manager. Mr. Macfee will remain in the Chicago area. No other Interstate personnel will be retained, according to Clarke and any additional workers will be drawn from the Wichita labor supply.

The Interstate plant, which was recently taken over by Miro-Flex, has been producing original equipment for several of the major truck manufacturers.

Mr. Clarke hinted at further expansion of the company, for he touched briefly on other items which would be available in the near future. He also referred to the new *Stimsonite* lenses which have replaced the former type in the Miro-Flare line of reflecting flares. The new lenses have fifty per cent greater reflecting candlepower than those formerly used. This is accomplished through increasing the number of reflecting facets in each lens by more than fifty per cent. In spite of this radical improvement, there is no increase in price contemplated.

Miro-Flex has been a leader in the manufacture of reflecting flares for more than 13 years.

Plastic Discs Used in Portland

The city of Portland, Oregon, has successfully used plastic line markers on a heavily-traveled bridge ramp where effective use of paint was impossible, according to a report by Fred T. Fowler, Portland Traffic Engineer.

Fowler said the city found it continually necessary to repaint traffic lanes on Lovejoy ramp, a long bridge approach which daily carries approximately 20,000 vehicles along its entire length. An additional 7,770 vehicles use a part of the ramp from another shorter approach.

Pictured above is the Tenth Avenue approach to Lovejoy ramp in Portland, showing Dur-O-Line plastic lane markers which were installed after traffic engineers found that heavy traffic made it difficult to keep lanes painted.

Adding to the wear was the fact that the four ramp lanes are only nine feet wide, and that the span serves an area which generates nearly all of the city's heavy interstate carrier traffic.

Using a three-man crew during April, 1948, when the ramp was closed to traffic, the city was able to install 1250 DUR-O-LINE plastic discs (manufactured by Traffic Safety Supply Company of Portland) over a two-day period. The crew used a high-speed drill to bore fastening holes for pins in the concrete pavement.

Discs on the ramp were spaced six feet apart. The city is also experimenting with the discs in pedestrian lanes, spacing them two feet apart there.

ON THE SHELF

President's Highway Safety Conference

Action program and committee reports. Washington, D. C., The Conf., 1949. Includes Accident Reports, Education, Enforcement, Engineering, Laws and Ordinances, Motor Vehicle Administration, Organized Public Support and Public Information. Set $1.50.

U. S. Bureau of Public Roads

The financing of highways by counties and local rural governments, 1921-1941. Washington, D. C., The Bureau, 1949. 98p. 45c.

Vogel, Joshua H. and Knecht, N. F.

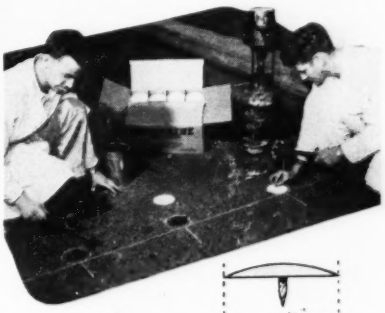
Parking of motor vehicles in cities. Seattle, Washington, The Univ., Washington, 1949. 1949. 80p.

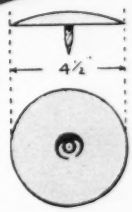
Washington. Bureau of Government Research and Service

Proceedings of the Northwest conference on traffic engineering. Seattle, Wash., The Bureau, 1949, n.p. 63p.

SAVE 50% ON STREET MARKING COSTS WITH DUR-O-LINE

(Available in Safety White, or Traffic Yellow)





A TENITE PLASTIC STREET MARKING SYSTEM

No More Repainting Costs
No More High Labor Costs

- **DUR-O-LINE** markers pay for themselves in one year. Cost of DUR-O-LINE Markers installed equals average cost of 2½ paint jobs.
- **DUR-O-LINE** marked streets are more attractive—the brilliant 4½" markers do not fade or smear.
- **DUR-O-LINE** markers have three times the visibility of painted lines.
- **DUR-O-LINE** markers are designed to withstand severest traffic conditions. Load tests prove that they can carry 15 times the maximum legal load limit.
- **DUR-O-LINE** markers are easy to install. A two-man crew can lay 100 markers in an hour. No traffic tie-ups. Traffic can run over markers as workmen lay them.
- **DUR-O-LINE** markers can be used on either asphalt or concrete pavements.

TRIAL OFFER

As a special offer 200 markers and laying material for 400 to 1200 linear feet is available for only $52. ($67. for concrete streets.) Test this sample offer on your busiest street. Shipped prepaid.

TRAFFIC SAFETY SUPPLY CO.
2700 NE Sandy Blvd., Portland 12, Ore.

Here's your sample of the new

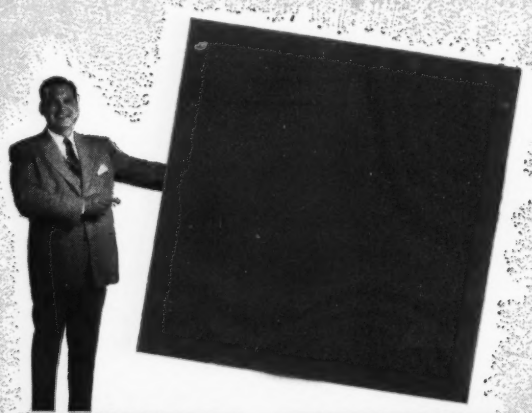
REG. U. S. PAT. OFF.

SCOTCHLITE

BRAND

"Flat-Top" Reflective Sheeting

with wide angle properties



- ✓ Brightness not affected by rain or sheet ice!
- ✓ Glass-smooth surface stays as clean as the finest enamel!
- ✓ Still performing brilliantly after 3 years of actual outdoor tests through summer sun and winter cold!
- ✓ Reflects a brilliant yellow in a radius of 170°!

FEEL IT...

Notice the smooth, enamel-like surface of this new sheeting—just like a hard automobile finish. It comes in silver, red, yellow; sheds dust and dirt . . . lasts and lasts under the toughest weather conditions!

TEST IT...

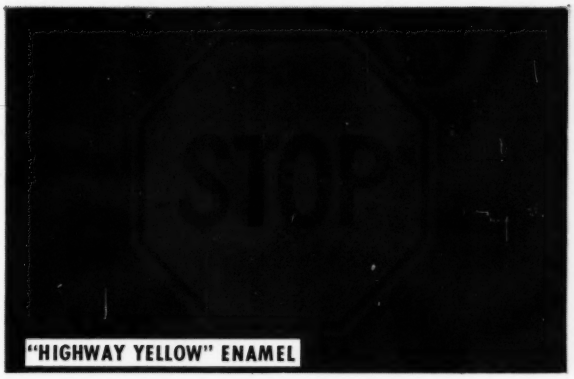
Place this sample in a dark room at eye level about 15 feet away. Hold a flashlight up under your eyes and train it on the sample from any angle. That's what we mean by wide angle effectiveness!

DOUSE IT...

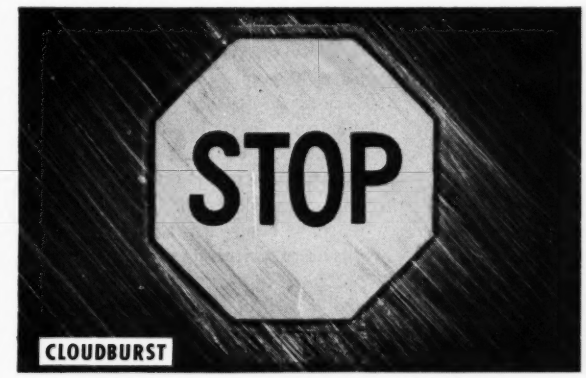
Submerge the sample in a glass of water or shallow pan and test it again. Notice how it reflects with undiminished brilliance. And it works with equal effectiveness under sheet ice conditions!

TRY IT!

Install this new sheeting on a sample group of signs. Test it for long-range target value, wide angle brilliance, legibility, all-weather performance . . . it'll outperform any reflective material you can buy!



MATCHLESS WIDE-ANGLE BRIGHTNESS! 120 times the brightness of "Highway Yellow" Enamel . . . that's the kind of year-in, year-out brilliance you get with this new sheeting. And it reflects vivid yellow through 170° of angularity! No "washing-out" of the warning yellow as you approach; full-color warning continues until you're practically abreast of it!



Reflects Brilliantly even in a Cloudburst!

New "Scotchlite" Flat-Top Reflective Sheeting carries a top coating that protects it against any form of moisture, in any quantity. No amount of water can cause this new sheeting to lose its matchless brilliance . . . and that brilliance *continues for the life of the sheeting!*

READY-MADE SIGNS may be obtained from your supplier with "Scotchlite" Flat-Top Reflective Sheeting. All are made in accordance with U.S.B.P.R. specifications, including rounded lettering. Write today for price list and samples. Will also have a representative call if you wish. Address Dept. TE80, Minnesota Mining & Mfg. Co., St. Paul 6, Minn.

Made in U.S.A. by MINNESOTA MINING & MFG. CO., St. Paul 6, Minn., also makers of "Scotch" Brand Pressure-sensitive Tapes, "Scotch" Sound Recording Tape, "Underseal" Rubberized Coating, "Safety-Walk" Non-Slip Surfacing, "3M" Abrasives, "3M" Adhesives. General Export: Durex Abrasives Corp., New Rochelle, N. Y. In Canada: Canadian Durex Abrasives Ltd., Brantford, Ontario.

General Motors Builds Technical Center

Construction of the General Motors Technical Center on the 320-acre site at Mound and Twelve-Mile roads north of Detroit was begun the middle of June.

The new center will embrace the vast research, engineering staff, processing and styling operations of General Motors and provide an entirely new concept of industrial research to meet tomorrow's needs.

Its aim is to develop closer liaison between research and experimental facilities and the production units of the organization.

C. E. Wilson, President of General Motors, explained that this development will in no way change the GM concept of divisional responsibility for each division's product engineering, inasmuch as the new center will have no direct product responsibility for the output of manufacturing units.

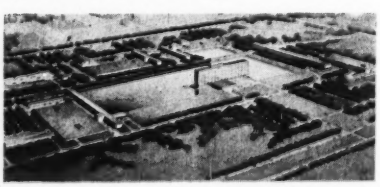
He said the center would be purely a research and technical fact finding and experimental development activity.

William J. Davidson, Administrative Engineer of the Technical Center, revealed that the construction timetable, extending over the next three years, will get under way with ground breaking for the Engineering Group. This will consist of administration and drafting, shop and dynamometer buildings, a total of 235,000 square feet of office and shop space.

Next will be the Research Laboratories Division Group—427,000 square feet of office, laboratory and shop space —consisting of metallurgical, laboratory, mechanical and processing buildings.

First work on the Research Group also will begin this year, immediately following the Engineering Group.

Initial buildings in the Engineering Group, Mr. Davidson said, are expected to be ready for occupancy by the early summer of 1950, followed immediately by the Research Group.



This aerial perspective of the General Motors Technical Center shows the Research Laboratories Division buildings at the left. The Styling Section group stands at the opposite or south end of 22-acre artificial lake (right). Left to right along the eastern side of the lake are two other groups, Processing and Engineering Staff, while in the center of the side, extending over the artificial lake, is a proposed administration building.

The buildings will be grouped around a 22-acre lake that will not only lend beauty to the surroundings but also will have a utility value in connection with the center's operations.

"The entire Technical Center property measured one and a half miles long and about a half mile wide. It is a 30-minute drive from the General Motors Building and will give technicians, laboratory, shop and administrative office workers the advantage of "country atmosphere with city services," Mr. Davidson declared.

Report Published on the Transportation Problem in Chicago

The University of Chicago Press recently published a report entitled "The Daytime Population of the Central Business District of Chicago *With Particular Reference to the Factor of Transportation,*" by Gerald William Breese.

One of a series of monographs on metropolitan Chicago. "The present study represents one of the first comprehensive efforts to depict the magnitude and the character of this problem *(congestion)* for Chicago. . . . By determining the number and sources and the purposes of people who visit the central business district in Chicago known as the Loop, and by depicting the means of transportation that they use, Mr. Breese has found a way of describing the nature of the problem and laying bare the factors that must be considered in any attempt to solve it."

The report discusses and illustrates by means of maps, charts, graphs and statistical tables, the population pattern, the transportation pattern and the commercial and industrial pattern of the area. It discusses the business, cultural, educational, recreational, governmental and residential functions of the central business district and then shows the origin of persons entering the district. The numbers of people entering are given by various means of transportation, by accumulation patterns, hourly fluctuations, daily and seasonal fluctuations, daytime and evening or night comparisons, and distinctions are drawn between the inner and outer central business district. The final section deals with land-use and land-value patterns and the distribution of the population, distinguishing between employees, residents and hotel populations, and finally the distribution of pedestrians.

This study, which is something of a pioneering work, and others which could be made for other cities provide invaluable information to the city planner, the housing official, the traffic engineer, the politician, the tax officials, and to those responsible for national defense.

Billboards Excluded From Alaska Highways

Chapter 59 of the Laws of 1949 enacted by the Legislature of the Territory of Alaska has for its purpose protection of traffic on the Territory's highways from obstructive outdoor advertising and the preservation of scenic beauty that might be impaired by such advertising. Section 2 of the act defines "outdoor advertising" as follows:

> "Section 2. DEFINITION. The term 'outdoor advertising' as used in this Act, shall include all commercial advertising so displayed as to attract the attention of persons on any public highway or while in a vehicle of a common carrier, or in any station, public building, park or other public place, whether such advertising be by means of printing, writing, painting, pictures, or a combination thereof, and whatever be the means of display, except that it shall not include advertising located within incorporated towns nor upon private property in rural areas and relating exclusively to the business conducted on such property or the sale or rental thereof, or directional signs on the public domain pertaining to and within 2500 feet of such rural businesses."

Section 3 prohibits all outdoor advertising as defined in Section 2, except political advertising material. Section 4 provides for penalties for violators ranging from a $50 minimum to a $500 maximum.

Alaska seems to have been very farsighted in enacting a law of this type while there still are comparatively few improved highways, and unsightly billboards have not yet had a chance to reduce the effectiveness of the highways or mar the scenic beauties.

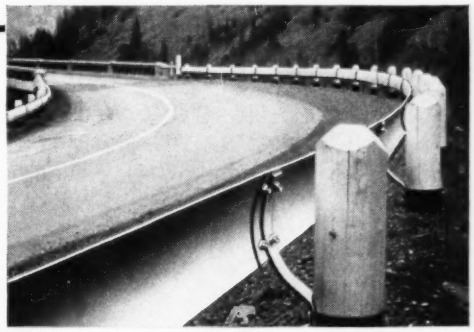
Highway Research Correlation Service, Circular No. 104

Don't forget to order your copy of ANNUAL PROCEEDINGS of INSTITUTE OF TRAFFIC ENGINEERS priced at $2.00 per copy.

Send your order direct to ITE Headquarters, Strathcona Hall, New Haven 11, Connecticut.

Exceeds all state safety specifications

TUTHILL HYWAY GUARD



cuts traffic accidents!

Write for technical brochure today!

Super-strong Hyway Guards safely deflect cars and cushion shock to vehicle, occupants and rail. Easily seen by day or night. Speedy, permanent erection with little or no maintenance required.

TUTHILL SPRING CO.
760 W. Polk Street, Chicago 7, Illinois

YOURS FOR THE ASKING.....

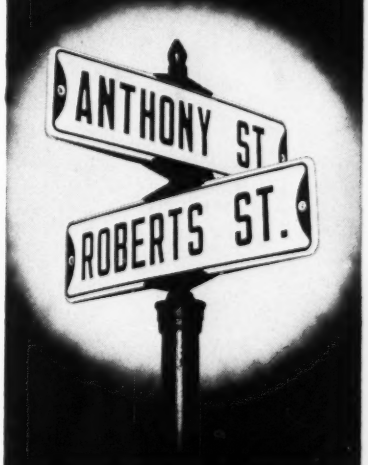
A NEW GRANITE CURB FOLDER 7T—Containing complete specifications on fabrication and setting of Standardized Granite Curb, also detail drawing of high speed highway entrances and exits. Every traffic engineer should have it.—Write for your free copy today.

H. E. FLETCHER CO.
GRANITE

West Chelmsford, Mass.
Lowell 7588
104 East 40th St., New York 16, N.Y.
ORegon 9-4210

Beautiful, Legible, Low-Priced

STREET NAME SIGNS



WRITE FOR CATALOG

Cataphote Corporation

TOLEDO, OHIO

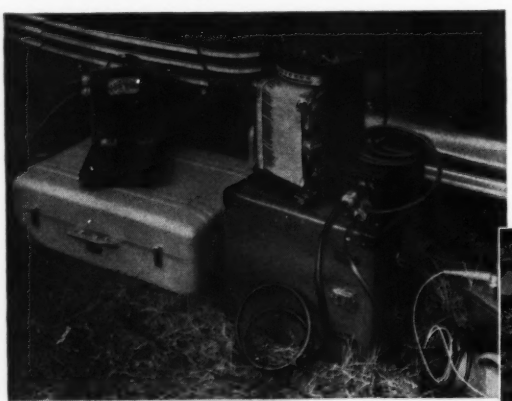
ELECTRO-MATIC
Speed Meter

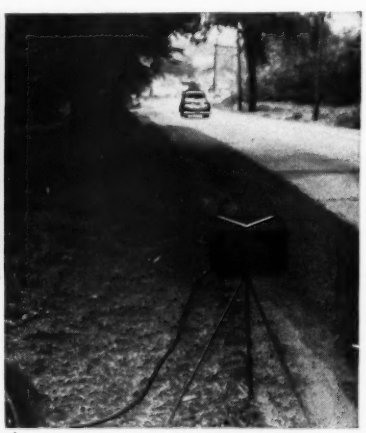
Model S-1 Electro-Matic *Speed Meter* measures the speed of moving vehicles from 0 to 100 m.p.h. This precision instrument operates with radio-frequency microwaves and is accurate within 2 m.p.h. A *Graphic Recorder* is connected in circuit with the *Speed Meter* when a permanent speed reading record is desired.

The instrument is quickly set up and connected, ready for operation after a minute or so for heating tubes. Under average conditions operating zone is about 150 ft. in advance of Antenna Unit. Continuous speed measurement is made of vehicles moving within the direct microwave radiation path.

For operating convenience, the *Speed Meter* is in 3 parts: Antenna Unit, Indicator Unit, Power Unit. The Antenna Unit is beamed at oncoming or receding traffic and may be located in a parked car or set up near the roadway. At the convenience of the operator the Indicator Unit and the Power Unit may be placed within or without the car. An aluminum carrying case is provided to contain the 3 units and connecting cables—total weight about 45 lbs.

The *Speed Meter* operates from a 6 volt automobile battery (8 amp drain) or from a 120 volt 50-60 cycle AC supply (50 watt rating). The *Graphic Recorder* is spring wound, has a capacity of 100 ft. of tape and operates at a speed of 1½ inches per minute.





★ **Microwave Accuracy**
★ **Car Battery Operation**
★ **No Road Tubes or Wires**
★ **Easy Portability**

Send for Speed Meter Literature

Automatic Signal Division
EASTERN INDUSTRIES INCORPORATED
In Canada, write to: Northern Electric Co., Ltd., Belleville, Ontario

TRAFFIC ACTUATED

NORWALK, CONNECTICUT

EAGLE SIGNAL "EF" MULTIDIAL CONTROLLER

Proven KEY to adequate Traffic Control!

UNITIZED CONSTRUCTION!

Originated by EAGLE and introduced to the industry in 1945.

No key is needed to remove each individual Cycle Unit with its individual synchronous disc motor. Just uncouple the jack connections and lift it out!

Cities throughout the United States such as Detroit, Los Angeles, Seattle, New Haven, Atlanta, Fort Worth, Oklahoma City and Indianapolis have used and successfully proven the high efficiency of the Eagle "EF" Multidial "Unitized" Controller in large quantities. Many other municipalities large and small are happy with its results.

Do you have a complicated traffic problem? Do you have problems involving varying density of traffic? Do you anticipate added complications at an intersection now in need of traffic control? . . . The "EF" Controller is the equipment for your city!

We want you to know more about the "EF"
Write for Bulletin E10 Today!

EAGLE SIGNAL CORPORATION *Moline, Illinois*

NEW "SCOTCHLITE" FLAT-TOP

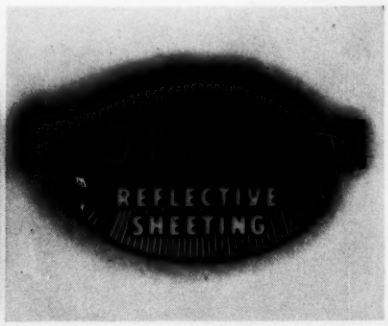
Reflective Sheeting gives "fair weather" visibility in Rain...Sleet...Icing Conditions !

BECAUSE ITS SURFACE is smooth as glass, this new sheeting reflects with undiminished brightness under any form of moisture. Even in cloudbursts, sleet, or under glare ice, this new material flashes back its safety message clearly and brilliantly.

EXTRA EFFECTIVE—because signs reflectorized with "SCOTCHLITE" Sheeting reflect the *complete* sign—true shape, true color, entire message. And 3 years of testing proves this brilliance *lasts*. Glass-smooth surface stays clean as finest enamel.

EASY TO APPLY—simply strip off protective backing to expose dry, precoated adhesive. Wipe on adhesive activator and sheeting is ready to apply. If you use a vacuum applicator no liquid activator is necessary; heat will activate the adhesive. No separate adhesive cans, brushes, spray guns, drying racks!

READY-MADE SIGNS may be had from your supplier made with regular "Scotchlite" Reflective Sheeting. All meet U.S.B.P.R. specifications, including rounded lettering. Write today for price list and samples. We'll also have a representative call if you wish. Address Dept. TE90, Minnesota Mining & Mfg. Co., St. Paul 6, Minn.



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